GOVERNMENT OF TAMIL NADU

HIGHER SECONDARY FIRST YEAR

ECONOMICS

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Department of School Education

Untouchability is Inhuman and a Crime

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HOW TO USE THE BOOK?

Chapter content	It presents a complete overview of the chapter
Introduction	Summary of the presentation in every chapter
Objectives	Goals to transform the class room processes into learner centric with a list of bench marks
Think and Do	Amazing facts and rhetorical questions to lead students to economic inquiries
Boxes	Additional inputs to the content is provided
Activity	Directions are provided to students to conduct activities in order to explore and enrich the concept.
	To motivate the students to further explore and enrich the concept
 **ICT**	To improve the computer based learning skills.
Tables	Give the values derived from functions which are graphed in the diagrams
Concept Diagrams	Conceptual diagrams that depict relationships between concepts to enable students to learn the content schematically.
Diagrams	To illustrate the situations.
Glossary	Explanation of scientific terms
Model Question Papers	For Evaluation
References	List of related books for further details of the topic
Web links	List of digital resources

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CAREER GUIDANCE

CAREER PROSPECTS IN ECONOMICS

The career prospects for economics graduates are many. Numerous fields are waiting for economic graduates both in public as well as private sectors. In the government sector, one may try for Indian Economic Services, jobs in Reserve Bank of India, PSUs and other public sector banks. All these jobs have wonderful career options. These jobs give social prestige along with financial stability. Private sector also offers jobs for economic graduates in the fields like private banks, MNCs, BPOs, KPOs, Business journals and newspapers. A good opportunity is also waiting for economic students in higher education. One can pursue Ph.D. in economics to enter into the field of teaching in schools, colleges and universities and research in hundreds of Research Institutes and funding agencies – national & international.

One makes a successful career as a Corporate Lawyer after BA in economics followed by LLB. BA in economics and MBA placed one at a better position in the private sector. Economic Journalism is another shining area for job perspective.

FAMOUS UNIVERSITIES AND COLLEGES OFFERING ECONOMICS

There are many institutes, colleges and universities that have economics in its BA, MA and Ph.D. level courses. Here are the lists of institutions offering economics. One can easily see other information related with the respective universities/colleges/institutes with their given website.

Delhi School of Economics www.econdse.org	**Sri Ram College of Commerce** www.srcc.edu	**University of Delhi, South Campus** www.south.du.ac.in	**University of Agriculture Science** www.uasbangalore.edu.in
Jawaharlal Nehru University, Delhi www.jnu.ac.in	**St. Stephen College, Delhi** www.ststephens.edu	**University of Bombay** www.mu.ac.in	**Ravenshaw University, Cuttack** www. ravenshawuniversity.ac.in
IIT Kanpur www.jnu.ac.in	**Madras School of Economics** www.mse.ac.in	**BITS –Pilani** www.bits-pilani.ac.in	**Gokhale Institute of Economics & Politics, Pune** www.gipe.ac.in
IIT Madras https://www.iitm.ac.in	**Presidency College, Kolkata** www.presiuniv.ac.in	**Indian Statistical Institute, Kolkata Bangalore** www. isical.ac.in	**Symbiosis School of Economics** www.sse.ac.in
Banaras Hindu University www.bhu.ac.in	**University of Hyderabad** www.uohyd.ernet.in	**IGIDR-Mumbai** www.igidr.ac.in	**Centre for Development Studies Thiruvananthapuram** www.cds.edu

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Jobs in Economics Field

An array of employment opportunities is available in economics field. Meritorious candidates can get excellent job opportunities after successfully completing their BA or MA in economics.

Government Sectors

Economics graduates can get prestigious jobs in the government sectors like

- **Indian Civil Services**
- **Indian Economic Services**
- **Reserve Bank of India**
- **National Sample Survey**
- **Ministry of Economic Affairs**
- **Planning Board**
- **Planning Commission (State & Central)**
- **National Council for Applied Economic Research and**
- **National Institute of Public Finance and Policy.**

Other than Government Sectors

Job opportunities are also waiting in the private sectors, NGOs and International Aid Agencies. The firms like World Bank, Asian Development Bank, IMF, and other Development Banks, Aid agencies, Financial Consultancy firms are hiring the economic graduates for their various positions. One can assume in these organisations as economist, economic advisor, executive, analyst, consultant, researcher, financial analyst, business analyst, economic research analyst and stock market analyst. As far as salary is concerned, lots of candidates are hired through campus placement. The average salary is Rs. 4 to 8 lakh per annum. But for the deserving candidates, the field opens plethora of options and remuneration is also beyond expectation. The filed like accountancy, actuarial, banking, insurance also open many jobs opportunities.

Economics Employment Opportunities

The various fields are offering better job opportunity after passing BA or MA in economics. Some of the high demand sectors are given below where job prospects are huge.

CAREERS FOR AN ECONOMIST			
Banking and Finance	**Government and Public Sector**	**Education and Communications**	**Business**
Commodities Broker	Claims Examiner	Professor	Market Research Analyst
Bank Management Trainee	Foreign Trade analyst	Technical Writer	Retail Buyer
Financial Analyst	Tax Auditor	Journalist/Columnist	Staff Training and Development Specialist
Economic Forecaster	Public Administrator	Teacher	Insurance Underwriting Trainee
Investment Banker	Legislative Assistant	Higher Education, Administration	Management Consultant
Loan Counsellor	Regional/Urban Planner	Educational Television Advisor	Strategic Planner
Securities Analyst	Financial Planner	Information Analyst	Business Administrator

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Assessment

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CHAPTER

1 Introduction to Micro Economics





"Economics is everywhere, and understanding economics can help you make better decisions and lead a happier life"

–Tyler Cowen

Learning Objectives

1. To acquire a fundamental knowledge on the subject of Economics and to understand its nature and scope; and,
2. To understand the meaning of some of the basic concepts of Economics and to observe how they are applied in the various definitions formulated on the science of Economics

1.1 Introduction

A subject should have a name or a title that facilitates a clear and correct understanding of its contents. For a subject like Economics, there are many books available with titles such as '*Introductory Economics*', '*Economics: An Introduction*', '*Basic Economics*', '*Elements of Economics*', '*Elementary Economics*', '*Fundamentals of Economics*' etc. But these books have the same contents, though each is intended to serve readers of different levels of interest and capacity.

A good introduction to a subject, besides containing the meaning of its title, should have an explanation of the nature and scope of the subject, i.e., whether the subject is traditional or modern, static or dynamic. The readers should be in a position to clearly classify the subject as belonging to either arts alone, or to science alone or to both. The significance of all the branches of the subject should find a place in it. As they go through the introduction, the readers should be able to understand the relationships of the subject with other subjects. Newer areas incorporated into the subject and the newer ways of comprehending its contents are to be highlighted in the introduction. The methodologies applied in the derivation of its laws are to be stated in such an introduction.

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1.2 Economics: Meaning

The term or word 'Economics' comes from the Ancient Greek *oikonomikos* (*oikos* means "households"; and, *Nemein* means "management", "custom" or "law"). Thus, the term 'Economics' means 'management of households'. The subject, earlier known as 'Political Economy', is renamed as 'Economics', in the late 19th century by Alfred Marshall.

1.3 Economics: Its Nature

The nature of a subject refers to its contents and how and why they find a place in the subject. This nature is understood by studying the various definitions given by the notable economists. The existence of multiplicity of the definitions makes some scholars comment that a search for a clear definition of Economics is a futile exercise. J. M. Keynes, for example, observes that *"Political Economy is said to have strangled itself with definitions"*. Their presence makes studying a subject interesting, exciting, enjoyable, or worthwhile. In fact, their presence in a social science subject is a clear sign of the growth of the science. It indicates that there exists freedom for people associated with such as science to formulate fresh definitions. These associates appreciate and make use of the opportunity afforded to them and come up with a plethora of definitions saying: 'The more, the merrier'. Each definition represents a unique generalisation. A wide variety of definitions paves the way to arrive a near-complete agreement on the subject-matter of Economics.

A science grows stage by stage, and at every stage, its newer definition emerges and a concept associated with it receives some special emphasis. However, the study of a subject is made possible when it possesses clear cut definition and boundary.

Four definitions, each referring to particular stage of the growth of the subject of Economics, are presented here. They are:

01. Smith's Wealth Definition, representing the Classical era;
02. Marshall's Welfare Definition, representing the Neo-Classical era;
03. Robbins' Scarcity Definition, representing the New Age; and,
04. Samuelson's Growth Definition, representing the Modern Age.

1.3.1 Wealth Definition: Adam Smith *(The classical era)*


Adam Smith

Adam Smith (1723-1790), in his book "*An Inquiry into Nature and Causes of Wealth of Nations*" (1776) defines "*Economics as the science of wealth*". He explains how a nation's wealth is created and increased. He considers that the individual in the society wants to promote his own gain and in this process, he is guided and led by an "*invisible hand*". He states that every man is motivated by his self interest. This means that each person works for his own good.

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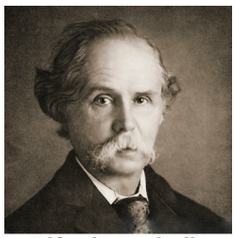
Smith favours the introduction of "division of labour" to increase the quantum of output. Severe competition in factories and society helps in bettering the product. Supply force is very active and a commodity is made available to the consumers at the lowest price.

The publication of Adam Smith's "The Wealth of Nations" in 1776, has been described as "the effective birth of economics as a separate discipline".

Criticism

For Smith, Economics consists of 'wealth-getting' activities and 'wealth-spending' activities. An undue emphasis is given to material wealth. Wealth is treated to be an end in itself. This view leads him to ignore human welfare as an essential part of Economics. Smith gives his definition when religious and spiritual values are held high. *Ruskin* and *Carlyle* regards Economics as a '*dismal science*', as it teaches selfishness which is against ethics.

1.3.2 Welfare Definition: Alfred Marshall
(The Neo- classical era)


Alfred Marshall

Alfred Marshall (1842-1924) in his book "*Principles of Economics*" (1890) defines Economics thus: "*Political Economy" or Economics is a study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of well-being. Thus, it is on one side a study of wealth; and on the other, and more important side, a part of the study of man.*"

The important features of Marshall's definition are:

a. Economics does not treat wealth as the be-all and end-all of economic activities. Man promotes primarily welfare and not wealth.

b. The science of Economics contains the concerns of ordinary people who are moved by love and not merely guided or directed by the desire to get maximum monetary benefit.

c. Economics is a social science. It studies people in the society who influence one another.

Criticism

a. Marshall regards only material things. He does not consider immaterial things, such as the services of a doctor, a teacher and so on. They also promote people's welfare.

b. In the theory of wages, Marshall ignores the amount of money that goes as reward for the services of 'immaterial' services.

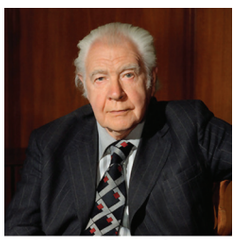
c. Marshall's definition is based on the concept of welfare. But it is not clearly defined. Welfare varies from person to person, country to country and one period to another. Marshall clearly distinguishes between those things that are capable of promoting welfare of people and those things that are not. Things like liquor that are not capable of promoting welfare but command

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a price, come under the purview of Economics.

d. However, welfare means happiness or comfortable living conditions of an individual or group of people. The welfare of an individual or nation is dependent not only on the stock of wealth possessed but also on political, social and cultural activities of the nation.

1.3.3 Scarcity Definition: Lionel Robbins *(The New Age)*


Lionel Robbins

Lionel Robbins published a book "*An Essay on the Nature and Significance of Economic Science*" in 1932. According to him, "*Economics is a science which studies human behaviour as a relationship between ends and scarce means which have alternative uses*".

The major features of Robbins' definition are:

a. Ends refer to human wants. Human beings have unlimited number of wants.

b. On the other hand, resources or means that go to satisfy the unlimited human wants are limited or scarce in supply. The scarcity of a commodity refers to limited supply only in relation to its demand.

c. Further, the scarce means are capable of having alternative uses. Hence, an individual grades his wants and satisfies first his most urgent want. Thus, Economics, according to Robbins, is a science of choice.

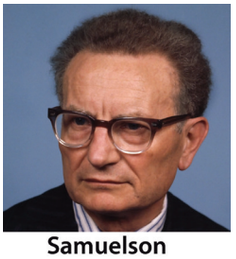
Criticism

a. Robbins does not make any distinction between goods conducive to human welfare and goods that are not. In the production of rice and alcoholic drink, scarce resources are used. But the production of rice promotes human welfare, while that of alcoholic drinks does not. However, Robbins concludes that *Economics is neutral between ends.*

b. Economics deals not only with the micro-economic aspects of resource-allocation and the determination of the price of a commodity, but also with the macro-economic aspects like how national income is generated. But, Robbins reduces Economics merely to theory of resource allocation.

c. Robbins' definition does not cover the theory of economic growth and development.

1.3.4 Growth Definition: Samuelson *(The Modern Age)*


Samuelson

Paul Samuelson published a book "An Introductory Analysis" in 1948. He defines Economics *as "the study of how men and society choose, with or without the use of money, to employ scarce productive resources which could have alternative uses, to produce various*

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commodities over time, and distribute them for consumption, now and in the future among various people and groups of society".

The major implications of this definition are as follows:

a. Like Robbins, Samuelson states that the means are scarce in relation to unlimited ends and that such means could be put to alternative uses.

b. Samuelson makes his definition dynamic by including the element of time in it. Therefore, his definition covers the theory of economic growth.

c. Samuelson's definition is applicable also in a barter economy, where money is not used.

d. His definition covers various aspects like production, distribution and consumption.

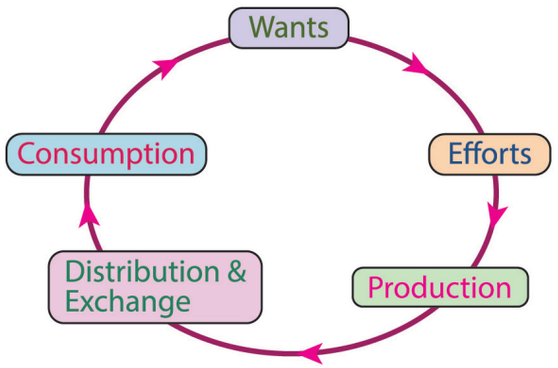
e. Samuelson treats Economics as a social science, whereas Robbins regards it as a science of individual behaviour.

Of all the definitions discussed above, the 'growth' definition stated by Samuelson appears to be the most satisfactory.

1.4 Scope of Economics

The scope of the subject of Economics refers to the subject-matter of Economics. It throws light on whether it is an art or a science and if science, whether it is a positive science or a normative science.

1.4.1 Economics: Its Subject-Matter



- Economics focuses on the behaviour and interactions among economic agents, individuals and groups belonging to an economic system. It deals with the activities such as the consumption and production of goods and services and the distribution of income among the factors of production. The activities of the rational human beings in the ordinary business of life under the existing social, legal and institutional arrangement are included in the Science of Economics; the abnormal persons and the socially unacceptable and unethical activities are excluded.
- Economics studies the ways in which people use the available resources to satisfy their multiplicity of wants. Scarcity is a problem indicating the gap between what people want and what they are able to get. This scarcity can be eliminated either by limiting the human wants or by increasing the supply of the goods that satisfy the

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human wants. The method of getting more is resorted to, rather than the method of wanting less.

- Economics is concerned with activities of human being only. Human beings are related to one another and the actions of one member affect those of the other members in the society. Hence, Economics is called a Human Science or Social Science.
- The activities of rational or normal human beings are the subject-matter of Economics.
- All human activities related to wealth constitute the subject-matter of Economics. Thus, human activities not related to wealth (non-economic activities) are not treated in Economics. For example, playing cricket for pleasure, mother's child care.

It is customary to clarify whether Economics is an art or a science; and if it is a science, to observe its specific features.

1.4.2 Economics is an Art and a Science

i. Economics as an Art

Art is the practical application of knowledge for achieving particular goals. Economics provides guidance to the solutions to all the economic problems.

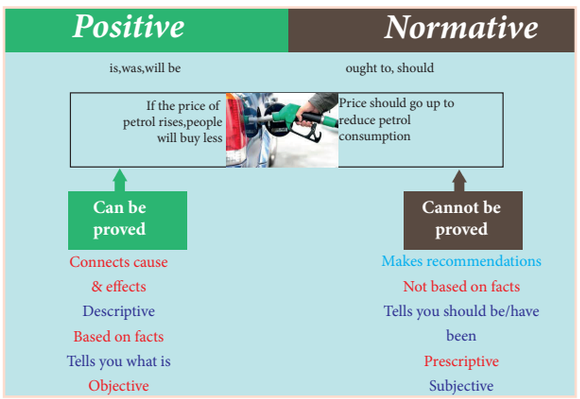
A. C. Pigou, Alfred Marshall and others regard Economics as an art.

ii. Economics as a Science

Science is a systematised body of knowledge. All its relevant facts are collected, classified and analyzed with its scale of measurement. Using these facts, science develops the co-relationship between cause and effect. Scientific laws derived are tested through experiments; and future predictions are made. These laws are universally applicable and accepted. Economists like Robbins, Jordon and Robertson argue that Economics is a science like Physics, Chemistry etc., since, it has several similar characteristics. Economics examines the relationships between the causes and the effects of the problems. Hence, it is rightly considered as both an art and a science. In fact, art and science are complementary to each other.

1.4.3 Economics: Positive Science and Normative Science

Positive science deals with what it is, means, it analyses a problem on the basis of facts and examines its causes. For example, at the time of a price increase, its causes are analysed.



On the other hand, normative science responds to a question like *what ought to be*. Here, the conclusions and results are not based on facts, but on different considerations belonging

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to social, cultural, political, religious realms. They are basically subjective in nature.

In short, positive science is concerned with *'how? and why?'* and normative science with *'what ought to be'*. The distinction between the two can be explained. An increase in the rate of interest, under positive science, would be looked into as to why and how can it be reduced, whereas under normative science, it would be seen as to whether it is good or bad.

Three statements about each type are given below:

Positive Economics

a. An increase in money supply implies a price-rise in an economy.

b. As the irrigation facilities and application of chemical fertilizers expand, the production of food-grains increases.

c. An increase in the birth rate and a decrease in the death rate reflect the rate of growth of population.

Normative Economics

a. Inflation is better than deflation.

b. More production of luxury goods is not good for a less-developed country.

c. Inequalities in the distribution of wealth and incomes should be reduced.

1.5 Basic Concepts in Economics

Like other sciences, Economics also has concepts to explain its theories. A complete and clear grasp of their meaning is necessary when the theories associated with them are studied. Only a preliminary acquaintance is now attempted here.

1.5.1 Goods and Services

Both goods and services satisfy human wants. In Economics, the term 'goods' implies the term 'services' also, unless specified otherwise.



Goods (also called 'products', 'commodities', 'things' etc)

a. as material things, they are tangible;

b. have physical dimensions, i.e., their physical attributes can be preserved over time;

c. exist independently of their owner;

d. are owned by some persons;

e. are transferable;

f. have value-in exchange;

Kinds of Goods (and Services)

a. Free and Economic goods

Free goods are available in nature and in abundance. Man does not need to incur any expenditure to own or use them. For example air, and sun shine. Water was also an example in the past, but at present it has exchange value. So it is not a free good.

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Milton Friedman, a Nobel laureate, popularises a saying: "*There is no such thing as a free lunch*". He means that it is impossible to get something for nothing. Even those offered 'free' always costs a person or the society as a whole. Its cost, however, is hidden. It is an externality. Someone can benefit from an externality or from a public good, but someone-else has to pay the cost of producing these benefits. In Economics, it refers to 'opportunity cost'.

PUBLIC VS PRIVATE GOODS

- PUBLIC GOODS
  - A good available to everyone to consume, Regardless of who pays and who doesn't.
  - Spillover benefits;
  - Non -rival in consumption and non- excludable;
  - E.g:National defence,Law enforcement.
- PRIVATE GOODS
  - A good consumed by a single person or Household;
  - No spillover benefits;
  - Rival in consumption and excludable;
  - E.g:food and drink

On the other hand, economic goods are not available in plenty. They are scarce in supply. Man has to spend money to own or use them.

b. Consumer goods and Capital goods:

Consumer goods directly satisfy human wants, TV, Furniture, Automobile etc.



Capital-goods (also called producer's goods) don't directly satisfy the consumer wants. They help to produce consumer goods. For example, machines do not directly satisfy the consumers, but in factories, the manufacturers need them.



c. Perishable goods and Durable goods:

Perishable goods are short-lived. Their life-span is limited. For example fish, fruits, flower etc., do not have a long life.



Durable goods and semi-durable goods have a little longer life-time than the Perishable goods. For example, a table, a chair etc.



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Services

Along with goods, services are produced and consumed. They generally, possess the following:

- **Intangible:** Intangible things are not physical objects but exist in connection to other things, for example, brand image, goodwill etc. But today, the intangible things are converted and stored into tangible items such as recording a music piece into a pen-drive. They are marketed as a good.
- **Heterogeneous:** Services vary across regions or cultural backgrounds. They can be grouped on the basis of quality standards. A single type service yields multiple experiences. For example, music, consulting physicians etc.
- **Inseparable from their makers:** Services are inextricably connected to their makers. For example, labour and labourer are inseparable; and,
- **Perishable:** Services cannot be stored as inventories like assets. For example, it is useless to possess a ticket for a cricket-match once the match is over. It cannot be stored and it has no value-in-exchange.

1.5.2 Utility

a. Meaning

'Utility' means 'usefulness'. In Economics, utility is the want-satisfying power of a commodity or a service. It is in the goods and services for an individual consumer at a particular time and at a particular place.



b. Characteristics of Utility

1. Utility is psychological. It depends on the consumer's mental attitude. For example, a vegetarian derives no utility from mutton;
2. Utility is not equivalent to usefulness. For example, a smoker derives utility from a cigarette; but, his health gets affected;
3. Utility is not the same as pleasure. A sick person derives utility from taking a medicine, but definitely, it is not providing pleasure;
4. Utility is personal and relative. An individual obtains varied utility from one and the same good in different situations and places;
5. Utility is the function of the intensity of human want. An individual consumer faces a tendency of diminishing utility;
6. Utility is a subjective concept it cannot be measured objectively and it cannot be measured numerically;
7. Utility has no ethical or moral significance. For example, a cook

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derives utility from a knife using which he cuts some vegetables; and, a killer wants to stab his enemy by that knife. In Economics, a commodity has utility, if it satisfies a human want;

c. Types of Utility

The following are the types of utility

1. **Form Utility:** An individual consumer obtains utility from a good or service only when it is available in a particular form. Raw materials in their original form may not possess utility for a consumer. But in their changed forms as they become finished products, they provide utility to him. For example, cotton as a raw material may not possess utility for a consumer; but as it gets a new form as a cloth, it yields the consumer utility.
2. **Time Utility:** A sick man derives time utility from blood not at the time of its donation, but only at the operation-time, i.e., when it is used.
3. **Place Utility:** A student derives place utility from a book not at the place of its publication (production centre) but only at the place of his education (consumption centre).
4. **Service Utility:** An individual consumer derives service utility from a service made available at the time when he most needs it. For example, clients obtain service utility from their lawyers, patients derive service utility from the doctors and so on.
5. **Possession Utility:** When a student buys a book or dictionary from a book seller, then only it gives utility.
6. **Knowledge Utility:** It is the utility derived by having knowledge of a particular thing. Advertisement serves as a source of information on an object.

d. Measurability of Utility

Wants of a person are satisfied by the act of consumption. The consumer derives utility, measured in terms of 'Utils'. An 'Util' is a unit of measurement of utility. An individual pays a price for the unit of the good, equal to the utility derived. Marshall states that utility can be measured indirectly using the 'measuring rod of money'.

1.5.3 Price

Price is the value of the good expressed in terms of money. Price of a good is fixed by the forces of demand for and supply of the good. Price determines what goods are to be produced and in what quantities. It also decides how the goods are to be produced.

1.5.4 Market

Generally, market means a place where commodities are bought and sold.

But, in Economics, it represents where buyers and sellers enter into an exchange of goods and services over a price.

1.5.5 Cost

Cost refers to the expenses incurred to produce or acquire a given quantum of a good. Together with revenue, it determines the profit gained or the loss incurred by a firm.

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1.5.6 Revenue

Revenue is income obtained from the sale of goods and services. Total Revenue (TR) represents the money obtained from the sale of all the units of a good. Thus, TR = P × Q, where TR is Total Revenue; P is the price per unit of the good; and, Q is the Total Quantity of the goods sold.

1.5.7 Equilibrium

a. Stable Equilibrium

Prof. Stigler states that "equilibrium is a position from which there is no net tendency to move". Its absence is referred to as disequilibrium. Consumer's equilibrium occurs when he gets maximum satisfaction. The equilibrium of the Producer occurs when he gets maximum profit. A resource is in equilibrium when it gets fully employed and gets its maximum payment. Where, static equilibrium is based on given and constant prices, quantities, income, technology, population etc.

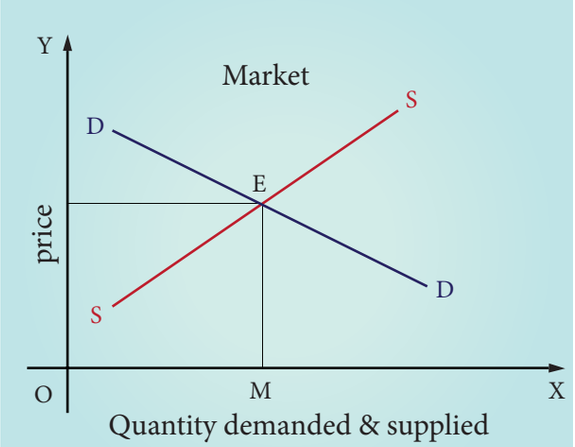


Diagram 1.1

b. Particular Equilibrium and General Equilibrium

An equilibrium, when it pertains to a single variable, may be called particular equilibrium.

An equilibrium, on the other hand, when it relates to numerous variables or even the economy as a whole, may be called general equilibrium.

1.5.8 Income

Income represents the amount of monetary or other returns, either earned or unearned small or big, accruing over a period of time to an economic unit. Nominal income refers to income, expressed in terms of money. It is termed as the *money income*.

Real income is the amount of goods that can be purchased with money as income. It is the purchasing power of income which is based on the rate of inflation.

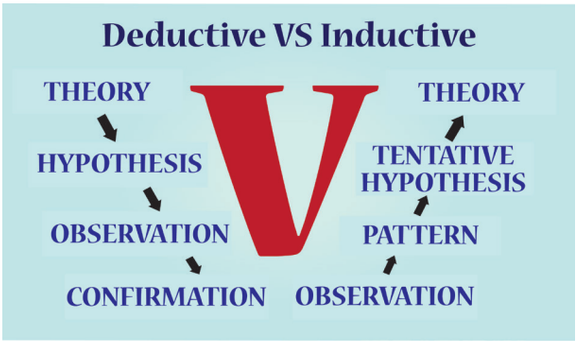
1.6 Economics: Its Methods, Facts, Theories and Laws

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1.6.1 Methods of Economics: Deduction and Induction

Like any other science, Economics also has its laws or generalisations. These laws govern the activities in the various divisions of Economics such as Consumption, Production, Exchange and Distribution. The logical process of arriving at a law or generalization in a science is called its method.

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Economics uses two methods: deduction and induction.

a. Deductive Method of Economic Analysis

It is also named as *analytical or abstract* method. It consists in deriving conclusions from general truths; it takes few general principles and applies them to draw conclusions. The classical and neo-classical school of economists notably, Ricardo, Senior, J.S.Mill, Malthus, Marshall, Pigou, applied the deductive method in their economic investigations.

Steps of Deductive Method

- **Step 1:** The analyst must have a clear and precise idea of the problem to be inquired into.
- **Step 2:** The analyst clearly defines the technical terms used in the analysis. Further, assumptions of the theory are to be precise.
- **Step 3:** Deduce hypothesis from the assumptions taken.
- **Step 4:** Hypotheses should be verified through direct observation of events in the real world and through statistical methods. (eg) There exists an inverse relationship between price and quantity demanded of a good.

b. Inductive Method of Economic Analysis

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

Economic generalizations are derived in this method, on the basis of

(i) Experimentations;

(ii) Observations; and,

(iii) Statistical methods.

- **Step 1:** Data are collected about a certain economic phenomenon. These are systematically arranged and the general conclusions are drawn from them.
- **Step 2:** By observing the data, conclusions are easily drawn.
- **Step 3:** Generalization of the data and then Hypothesis Formulation
- **Step 4:** Verification of the hypothesis (eg.Engel's law)

According to Engel's Law "The proportion of total expenditure incurred on food items declines as total expenditure [which is proxy for income] goes on increasing."

Economists today are of the view that both these methods are complementary. 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".*

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1.6.2 Economics: Facts, Theories

Using the methods, the economist observes facts, such as, changes in the price of a commodity. Similarly, the quantity demanded of that commodity also varies. And he observes these movements and comes up with a theory that these two movements are inversely related, i.e., when the price increases, the quantity demanded of that commodity decreases and vice versa. Thus, he formulates his theory of demand.

He tests his theory by collecting further facts and when his theory stands the test of time and obtains universal acceptance, the theory is raised to the status of a law.

1.6.3 Nature of Economic Laws

A Law expresses a causal relation between two or more than two phenomena. Marshall states that the Economic laws are *statement of tendencies*, and those social laws, which relate to those branches of conduct in which the strength of the motives chiefly concerned can be measured by money price.

In natural sciences, a definite result is expected to follow from a particular cause. In Economic science, the laws function with cause and effect. The consequences predicted by the data, necessarily and invariably follow.

However, Economic laws are not as precise and certain as the laws in the physical sciences. Marshall holds the opinion that there are no laws of economics which can be compared for precision with the law of gravitation.

Importance of Micro Economics

- To understand the operation of an economy
- To provide tools for economic policies
- To examine the condition of economic welfare
- Efficient utilization of resources
- Useful in international trade
- Useful in decision making
- Optimal resource allocation
- Basis for prediction
- Price determination

A physical scientist carrying out controlled experiments in his laboratory can test the scientific laws very easily by changing the conditions obtaining there. Changes in Economics science cannot be brought about easily. As a result, prediction regarding human behaviour is likely to go wrong. There are exceptions to the Law of Demand. Thus, economic laws are not inviolable.

As unpredictability is invariably associated with the economic laws. Marshall compares them to the laws of tides. Just as it cannot be predicted and said with certainty that a high tide would follow a low tide, unpredictability prevails in Economics. Human behaviour is volatile. Economic laws are not assertive but they are indicative. The Law of Demand, for example, states that other things remaining the same, the quantity demanded of a commodity increases, as its price decreases and vice versa.

The use of the assumption 'other things remaining the same' (ceteris

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paribus) in Economics makes the Economic laws hypothetical. It might be argued that the laws in other sciences can also be called hypothetical. It should be admitted however that in the case of Economics, the hypothetical elements in its laws are a little less pronounced than in the laws of physical sciences.

But since money is used as the measuring rod, laws in economics are more exact, precise and accurate than the other social sciences. As the value of the measuring- rod money is not constant, there is always an hypothetical element surrounding the laws of Economics.

Some economic laws are simply truisms. For example, saving is a function of income. Another example of truism is: human wants are unlimited.

1.7 Economics: Its Sub Divisions

Economics has been divided into some branches.

1.7.1 Consumption

Human wants coming under consumption is the starting point of economic activity. In this section the characteristics of human wants based on the behaviour of the consumer, the diminishing marginal utility and consumer's surplus are dealt with.

1.7.2 Production

Production is the process of transformation of inputs into output. This division covers the characteristics and role of the factors of production namely Land, Labour, Capital and Organization and also the relationship between inputs and output.

1.7.3 Exchange

Exchange is concerned with price determination in different market forms. This division covers trade and commerce. Consumption is possible only if the produced commodity is placed in the hands of the consumer.

1.7.4 Distribution

Production is the result of the coordination of factors of production. Since a commodity is produced with the efforts of land, labour, capital and organization, the produced wealth has to be distributed among the cooperating factors. The reward for factors of production is studied in this division under rent, wages, interest and profit. Distribution studies about the pricing of factors of production.

1.8 Economics: Its Types

Economics is a rapidly growing subject and its horizon has been expanding. The basic thrust of the subject is that there should be efficient allocation of the available scarce resources to obtain maximum welfare to the people on a sustainable basis. Given below are some of the major branches of the subject, where such efficient resource allocation is made.

1.8.1 Micro-economics

Micro Economics is the study of the economic actions of individual units say

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households, firms or industries. It studies how business firms operate under different market conditions and how the combined actions of buyers and sellers determine prices. Micro economics covers

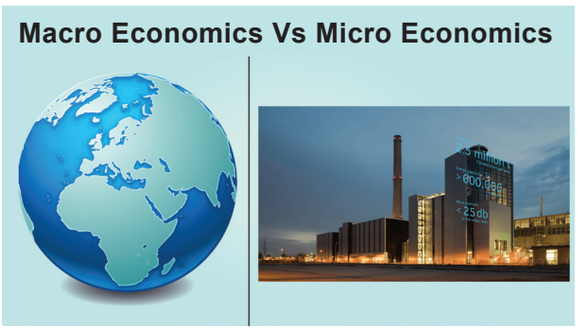
(i) Value theory (Product pricing and factor pricing)

(ii) Theory of economic welfare

The terms 'micro economics' and 'macro economics' were first used in economics by Norwegian economist *Ragner Frisch* in 1933. After Prof. Frisch, the terms earned popularity when J.M. Keynes clearly distinguished between the terms through his book entitled '*General theory of 'Employment, Interest and Money*' published in 1936.

1.8.2 Macro-economics

Macro economics is the obverse of micro economics. It is concerned with the economy as a whole. It is the study of aggregates such as national output, inflation, unemployment and taxes. *The General Theory of Employment, Interest and Money* published by Keynes is the basis of modern macro economics.



Difference between Micro Economics and Macro Economics

Micro Economics	Macro Economics
1. It is that branch of economics which deals with the economic decision-making of individual economic agents such as the producer, the consumer etc.	**1.** It is that branch of economics which deals with aggregates and averages of the entire economy. E.g., aggregate output, national income, aggregate savings and investment, etc.
2. It takes into account small components of the whole economy.	**2.** It takes into consideration the economy of the country as a whole.
3. It deals with the process of price determination in case of individual products and factors of production.	**3.** It deals with general price-level in any economy.
4. It is known as price theory	**4.** It is also known as the income theory.
5. It is concerned with the optimization goals of individual consumers and producers	**5.** It is concerned with the optimization of the growth process of the entire economy.

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1.8.3 International Economics

In the modern world, no country can grow in isolation. Every country is having links with the other countries through foreign capital, investment (foreign direct investment) and international trade.

1.8.4 Public Economics *(Public Finance)*

Public finance is concerned with the income or revenue raising and expenditure incurring activities of the public authorities and with the adjustment of the one with the other. The scope of Public Finance covers Public expenditure, Public revenue, Public debt, Financial administration and federal Finance.

1.8.5 Developmental Economics

The countries have been classified into developed, developing and under developed on the criteria of Per Capita Income, Human Development Index and Happiness Index. The Development Economics deals with features of developed nations, obstacles for development, Economic and Non-economic factors influencing development, various growth models and strategies.

1.8.6 Health Economics

Health Economics is an area of applied economics. It covers health indicators, preventive and curative measures, medical research and education, Rural Health Mission, Drug Price control, Neo natal care, Maternity and Child health, Budgetary allocation for health etc.

1.8.7 Environmental Economics

Depletion of natural resources stock and pollution result from rapid economic development. Hence the need for the study of Environmental Economics which analyse the inter relationship between economy and environment. Environmental Economics is a study of inter disciplinary tools for the problems of ecology, economy and environment.

1.9 Basic Economic Problems

If resources are abundant and wants are so few, then there would be no economic problem. But this situation can never exist. Resources are always scarce and our wants are numerous. Hence in every society certain choices have to be made.

THE ECONOMIC PROBLEM

- Wants,desires;unlimited
- Resources:Scarce
  -Not freely available
- Economic choice
- Economics
  -How people use scarce resources to satisfy unlimited wants

What and how much to produce?

Every society must decide on what goods it will produce are and how much of these it will produce. In this process, the crucial decisions include:

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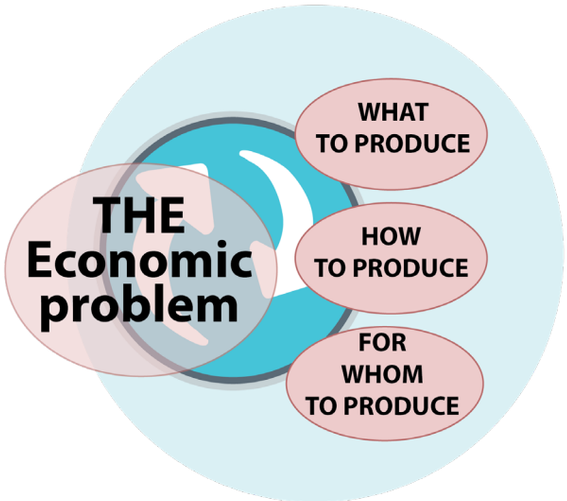
a. Whether to produce more of food, clothing and housing or to have more luxury goods

b. Whether to have more agricultural goods or to have industrial goods and services

c. Whether to use more resources in education and health or to use more resources in military services

d. Whether to have more consumption goods or to have investment goods

e. Whether to spend more on basic education or higher education



How to Produce?

Every society has to decide whether it will use labour-intensive technology or capital intensive technology; that is whether to use more labour and less machines and vice versa.

For whom to produce?

Every society must also decide how its produce be distributed among the different sections of the society. It must also decide who gets more and who gets less. It should also decide whether or not a minimum amount of consumption be ensured for everyone in the society. Due to the scarcity of resources, a society faces the compulsion of making choice among alternatives. It faces the problem of allocating the scare resources to the production of different possible goods and services and of distributing the produced goods and services among individuals within the economy.

1.10 Production Possibility Curve

The problem of choice between relatively scarce commodities due to limited productive resources with the society can be illustrated with the help of a geometric device, is known as production possibility curve. Production possibility curve shows the menu of choice along which a society can choose to substitute one good for another, assuming a given state of technology and given total resources.

The explanation and analysis of production possibility curve is based upon certain assumptions, some of them are following

(i) The time period does not change. It remains the same throughout the curve.

(ii) Techniques of production are fixed.

(iii) There is full employment in the economy.

(iv) Only two goods can be produced from the given resources.

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(v) Resources of production are fully mobile.

(vi) The factors of production are given in quantity and quality

(vii) The law of diminishing returns operates in production.

Every production possibility curve is based upon these assumptions. If some of these assumptions changes or neglected, then it affects the nature of production possibility curve.

To draw this curve we take the help of production possibilities schedule, as shown below.

Production possibilities schedule

Production possibilities	Quantity of food production in tons	No of car production
I	0	25
II	100	23
III	200	20
IV	300	15
V	400	8
VI	500	0

This schedule suggests that if all resources are thrown into the production of food, a maximum of 500 tons of food can be produced, given the existing technology. If on the other hand, all resources are instead used for producing cars, 25 cars can be produced. In between these two extreme possibilities exist. If we are willing to give up some food, we can have some cars.

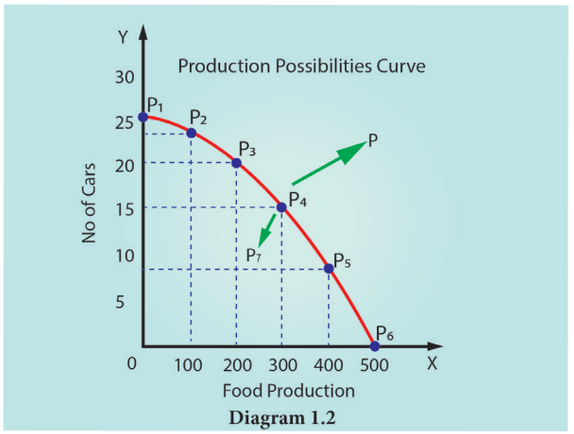


Diagram 1.2

We can obtain a production possibility curve by drawing production possibilities schedule graphically. The quantity of food is shown on x-axis and the number of cars is shown on y-axis, the different six production possibilities are being shown as point P_1 P_2 P_3 P_4 P_5 & P_6.

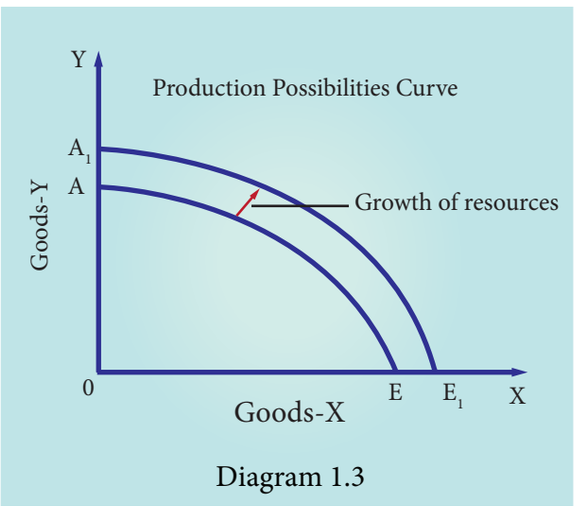


Diagram 1.3

Food production

If we assume that innumerable production possibilities exist between any two-production possibilities schedule, we get the production possibility curve P_1 to p_6. This shows the locus of points of the different possibilities of production of two commodities, which a firm or an

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economy can produce, with the help of given resources and the techniques of production. Points outside the production possibility (e.g. point p) are unattainable as society's resources of production are not sufficient to give output beyond the curve. Points lying inside the curve like P_7 are attainable by the society but at these points resources production are not fully employed. For example, if society is producing at point P_4 then it can increase the production of food keeping the no of cars constant or it can increase the production of cars keeping the food grain output constant or it can increase the output of both the goods simultaneously.

Shift of production possibility curve

The PPC shifts upward or downward due to:

1. The change in the supply of productive resources and
2. The change in the state of technology.

The production capacity of an economy grows overtime through increase in resource supplies and improvement of technology. This enables PPC to shift upward from AE to A_1E_1 as shown in figure below. This outward shift of the PPC is the basic feature of economic growth.

Uses of production possibility curve

Through the device of PPC can be used for many analytical purposes. We shall discuss below some of its popular uses.

(i) The problem of choice

The problem of choice arise because of the given limited resources and unlimited wants, may relate to the allocation of resources between the goods for the higher income group and the lower income group and the goods for the defense and the civilians. Since PPC is the locus of the combination of the goods the problem of choice will not arises when we choose any point on PPC.

(ii) The Notion of Scarcity

We can explain the notion of scarcity with the help of PPC. We know that every society possesses only a specific amount of resources, which can produce only limited amount of output even with the help of best technology, economic scarcity of best fact of life. The production possibility curve reflects the constraints imposed by the element of economic scarcity.

(iii) Solution of central problems

The central problems of an economy can be explained with the help of PPC. The solution of problem of what to produce involves the decision regarding the choice of location on the production possibility curves. A production combination represented by any point inside the PPC indicates that the economy is using inefficient methods of production and inefficient combination of resources.

1.11 Conclusion

This chapter has given a broad overview of economics. Moreover the present certain common characteristics of economics definitions of Wealth, Welfare, Scarcity & Growth free essential questions an economy must solve; what to produce, how to produce and for whom to produce and also looked at division of economics, distinguishing between Micro and Macroeconomics. It has introduced

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some basic concepts frequently appearing throughout the lesson.

It is perhaps both importance, the study of economics is an intellectually fascinating adventure highly relevant and it affects people's life. Every now and then after learning lesson, think of economic activities in and around you. Perhaps in this way learning of economics makes to think like an economist.

GLOSSARY

Scarcity	The gap between what people want and what people can get
Production	Creation of utility
Distribution	Share of the national income reaching the four factors of production
Services	Services, like goods, are economic entities; and are inseparable from their owners and are intangible, perishable in nature
Value	Power of a commodity to command other commodities in an exchange
Price	Value of a commodity expressed in terms of money
Income	The amount of monetary or other returns, either earned or unearned, accruing over a period of time
Deductive Method	Deduction is a process in logic facilitating or arriving at an inference, moving from general to particular
Inductive Method	Induction is a process in logic facilitative or arriving at an inference, moving from particular to general

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MODEL QUESTIONS

Part-A Multiple Choice Questions

1. 'Economics is a study of mankind in the ordinary business of life' -It is the statement of
   - a. Adam Smith
   - b. Lionel Robbins
   - c. Alfred Marshall
   - d. Samuelson

2. The basic problem studied in Economics is
   - a. Unlimited wants
   - b. Unlimited means
   - c. Scarcity
   - d. Strategy to meet all our wants

3. Microeconomics is concerned with
   - a. The economy as a whole
   - b. Different sectors of an economy
   - c. The study of individual economic units behaviour
   - d. The interactions within the entire economy

4. Which of the following is a microeconomics statement?
   - a. The real domestic output increased by 2.5 percent last year.
   - b. Unemployment was 9.8 percent of the labour force last year.
   - c. The price of wheat determines its demand
   - d. The general price level increased by 4 percent last year.

5. Find the odd one out:
   - a. "An inquiry into the nature and the causes of the Wealth of Nations"
   - b. "Principles of Economics"
   - c. "Nature and Significance of Economic Science"
   - d. "Ceteris paribus"

6. The equilibrium price is the price at which
   - a. Everything is sold
   - b. Buyers spend their money
   - c. Quantity demanded equals quantity supplied
   - d. Excess demand is zero

7. Author of "An Inquiry into the Nature and Causes of Wealth of Nations"
   - a. Alfred Marshall
   - b. Adam Smith
   - c. Lionel Robbins
   - d. Paul A Samuelson

8. "Economics studies human behaviour as a relationship between ends and scarce means which have alternative uses" is the definition of economics of
   - a. Lionel Robbins
   - b. Adam Smith
   - c. Alfred Marshall
   - d. Paul A Samuelson

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9. Who is the Father of Economics?
   a. Max Muller
   b. Adam Smith
   c. Karl Marx
   d. Paul A Samuelson

10. "Economics is a science" The basis of this statement is—
   a. Relation between cause and effect
   b. Use of deductive method and inductive method for the formations of laws
   c. Experiments
   d. All of the above

11. Utility means
   a. Equilibrium point at which demand and supply are equal
   b. Want-satisfying capacity of goods and services
   c. Total value of commodity
   d. Desire for goods and services

12. A market is
   a. Only a place to buy things
   b. Only a place to sell things
   c. Only a place where prices adjust
   d. A system where persons buy and sell goods directly or indirectly

13. Which one of the following is **not** a point in the Welfare Definition of Economics?
   a. Study of an ordinary man
   b. Economics does not focus on wealth alone
   c. Economics is the study of material welfare
   d. Economics deals with unlimited wants and limited means

14. Growth definition takes into account
   a. The problem of choice in the dynamic framework of Economics
   b. The problem of unlimited means in relation to wants
   c. The production and distribution of wealth
   d. The material welfare of human beings

15. Which theory is generally included under micro economics ?
   a. Price Theory
   b. Income Theory
   c. Employment Theory
   d. Trade Theory

16. ..... have exchange value and their ownership rights can be established and exchanged
   a. Goods
   b. Services
   c. Markets
   d. Revenue

17. Identify the correct characteristics of utility
   a. It is equivalent to 'usefulness'
   b. It has moral significance
   c. It is same as pleasure
   d. It depends upon consumer's mental attitude

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18. Who has given scarcity definition of economics?

a. Adam Smith

b. Marshall

c. Robbins

d. Robertson

19. The process of reasoning from particular to general is

a. Deductive method

b. Inductive method

c. Positive economics

d. Normative economics

20. Total revenue is equal to total output sold multiplied by

a. Price

b. Total cost

c. Marginal revenue

d. Marginal cost

Answers Part-A

1	2	3	4	5	6	7	8	9	10
c	c	c	c	d	c	b	a	b	d
11	12	13	14	15	16	17	18	19	20
b	d	d	a	a	a	d	c	b	a

Part-B Answer the following questions in one or two sentences.

21. What is meant by Economics?

22. Define microeconomics.

23. What are goods?

24. Distinguish goods from services.

25. Name any two types of utility.

26. Define positive economics.

27. Give the meaning of deductive method.

Part-C Answer the following questions in one paragraph.

28. Explain the scarcity definition of Economics and assess it.

29. What are the crucial decisions involved in 'what to produce?'

30. Explain different types of economic activities.

31. What are the different features of services?

32. What are the important features of utility?

33. Distinguish between microeconomics and macroeconomics.

34. Compare positive economics and normative economics.

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Part-D Answer the following questions in about a page

35. Compare and contrast various definitions of Economics.

36. Explain various Steps of Deductive and Inductive methods.

37. Elaborate the nature and scope of Economics.

38. Explain basic problems of the economy with the help of production possibility curve.

ACTIVITY

Meet ten of your class-mates and prepare a Report on the advantages of studying Economics.

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CHAPTER

2 Consumption Analysis

"Consumption is the sole end and object of economic activity"

– J. M. Keynes

Learning Objectives

3YXO4

1 *To understand the consumer behaviour when price changes.*

2 *To perceive the consumer equilibrium in terms of cardinal and ordinal approaches.*

2.1 Introduction

Consumption is an essential economic activity. The quantity and quality of consumption determine the standard of living of the people. Consumption is the act of satisfying one's wants. Consumption is defined as "*the use of goods and services for satisfying wants*". In economics, consumption is studied both at micro level and macro level.

Consumption is the beginning of economic science. In the absence of consumption, there can be no production, exchange or distribution. Consumption is also an end of production. Producers produce goods to satisfy the wants of the people.

2.2 Human Wants

In ordinary language desire and want mean the same thing. But in economics they have different meanings. Wants are the basis for human behaviour to buy and consume goods.

2.3 Characteristics of Human Wants

a. Wants are unlimited

Human wants are countless in number and various in kinds. When

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one want is satisfied another want crops up. Human wants multiply with the growth of civilization and development.

b. Wants become habits

Wants become habits; for example, when a man starts reading news paper in the morning, it becomes a habit. Same is the case with drinking tea or chewing pans.

c. Wants are Satiable

Though we cannot satisfy all our wants, at the same time we can satisfy particular wants at a given time. When one feels hungry, he takes food and that want is satisfied.

d. Wants are Alternative

There are alternative ways to satisfy a particular want eg. Idly, dosa or chappathi.

e. Wants are Competitive

All our wants are not equally important. So, there is competition among wants. Hence, we have to choose more urgent wants than less urgent wants.

f. Wants are Complementary

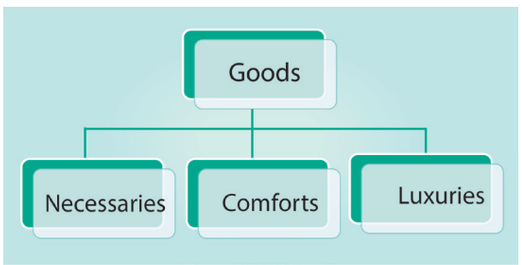
Sometimes, satisfaction of a particular want requires the use of more than one commodity. Example: Car and Petrol, Ink and Pen.

g. Wants are Recurring

Some wants occur again and again. For example, if we feel hungry, we take food and satisfy our want. But after sometime, we again feel hungry and want food.

2.4 Classification Of Goods

Goods are broadly classified into three categories.

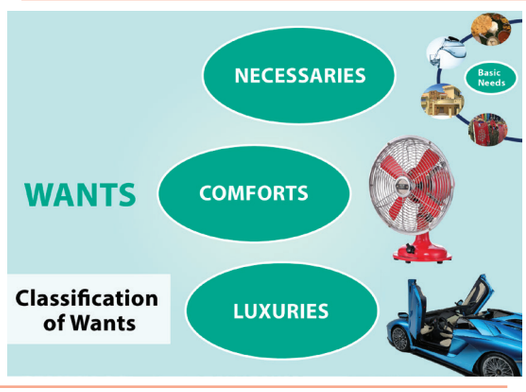


Necessaries

Goods which are indispensable for the human beings to exist in the world are called "Necessaries". For example, food, clothing and shelter.

Comforts

Goods which are not indispensable for life but to make our life easy, convenient and comfortable are called "Comforts". Example: TV, Fan, Refrigerator and Air conditioner.



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Luxuries

Goods which are not very essential but are very costly are known as "Luxuries". Example: Jewellery, Diamonds and Cars. However, for people with higher income they may look necessaries or comforts.

2.5 Cardinal Utility Analysis

2.5.1 The Law of Diminishing Marginal Utility (DMU)

Introduction

H.H.Gossen, an Austrian Economist was the first to formulate this law in Economics in 1854. Therefore, Jevons called this law as "Gossen's First Law of Consumption". But the credit goes to Marshall, because he perfected this law on the basis of Cardinal Analysis. This law is based on the characteristics of human wants, i.e., wants are satiable.

Definition

Marshall states the law as, "the additional benefit which a person derives from a given increase of his stock of a thing, diminishes with every increase in the stock that he already has".

Assumptions

1. Utility can be measured by cardinal numbers such as 1, 2, 3 and so on.
2. The marginal utility of money of the consumer remains constant.
3. The consumer should be a rational consumer and his aim is to attain maximum satisfaction with minimum expenditure.
4. The units of the commodity consumed must be reasonable in size.
5. The commodity consumed should be homogeneous or uniform in characters like weight, quality, taste, colour etc.
6. The consumption of goods must take place continuously at a given period of time.
7. There should be no change in the taste, habits, preferences, fashions, income and character of the consumer during the process of consumption.

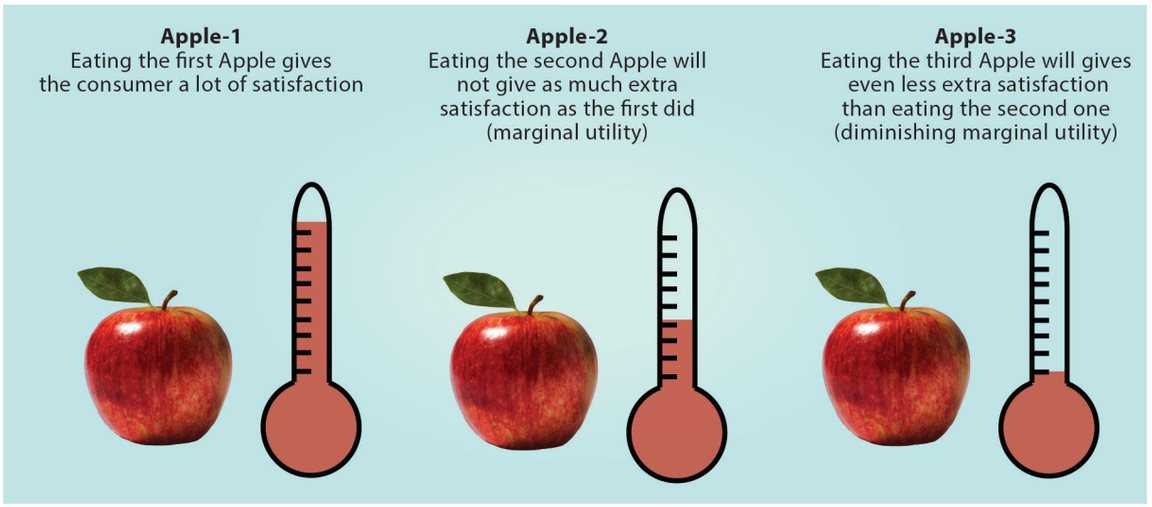
Explanation

The Law of Diminishing Marginal Utility states that if a consumer continues to consume more and more units of the same commodity, its marginal utility diminishes. This means that the more we have of a thing, the less is the satisfaction or utility that we derive from the additional unit of it.

Illustration

The law can be explained with a simple illustration. Suppose a consumer wants to consume 7 apples one after another. The utility from the first apple is 20. But the utility from the second apple will be less than that of the first (say 15), the third less than that of the second (say 10) and so on. Finally, the utility from the fifth apple becomes zero and the utilities from sixth and seventh apples are negative (or disutility or disliking). This tendency is called the

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"The Law of Diminishing Marginal Utility'. This is illustrated in table 2.1.

Table 2.1 The Law of Diminishing Marginal Utility

Units of Apple	Marginal Utility	Total Utility
1	20	20
2	15 (35-20)	35
3	10 (45-35)	45
4	5 (50-45)	50
5	0 (50-50)	50
6	-5 (45-50)	45
7	-10(35-45)	35

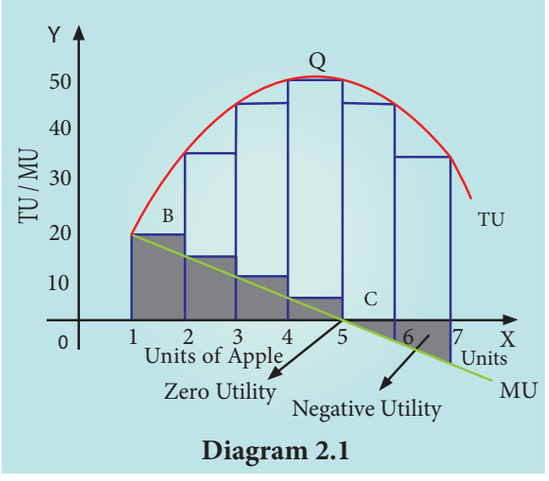


Diagram 2.1

In Table 2.1, we find that the total utility goes on increasing but at a diminishing rate. On the other hand, marginal utility goes on diminishing. When marginal utility becomes zero, the total utility is maximum and when marginal utility becomes negative, the total utility diminishes. Total utility refers to the total satisfaction derived from the consumption of a given quantity of a commodity. Marginal utility is the additional utility derived from one more additional unit of a commodity.

Criticism

1. Utility cannot be measured numerically, because utility is subjective.
2. This law is based on the unrealistic assumptions.
3. This law is not applicable to indivisible commodities.

Exceptions to the Law

1. Hobbies 2. Drunkards 3. Misers 4. Music and Poetry and 5. Readings

Importance or Application of the Law of DMU

1. The Law of DMU is one of the fundamental laws of consumption. It has applications in several fields of study.

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2. This law is the basis for other consumption laws such as Law of Demand, Elasticity of Demand, Consumer's Surplus and the Law of Substitution etc.
3. The Finance Minister taxes a more-moneyed person more and a less-moneyed person less. When a person's income rises, the tax-rate rises because the MU of money to him falls with every rise in his income. Thus, the Law of DMU is the basis for progressive taxation.
4. This law emphasises equitable distribution of wealth. The MU of money to the more-moneyed is low. Hence, redistribution of income from rich to the poor is justified.
5. Adam Smith explains the famous "diamond-water paradox". Diamond is scarce, hence, its MU is high and its price is high, even though it is not very much needed. Water is abundant, hence, its MU is low and its price is low, even though it is very much essential.



2.6 The Law of Equi-Marginal Utility

The law of diminishing marginal utility is applicable only to the want of a single commodity. But in reality, wants are unlimited and these wants are to be satisfied. Hence, to analyze such a situation, the law of diminishing marginal utility is extended and is called "The *Law of Equi-Marginal Utility*". It is also called the "*Law of Substitution*", "The Law of Consumers Equilibrium", "*Gossen's Second Law*" and "*The Law of Maximum Satisfaction*".

Definition

Marshall states the law as, "*If a person has a thing which he can put to several uses, he will distribute it among these uses in such a way that it has the same marginal utility in all. For, if it had a greater marginal utility in one use than another he would gain by taking away some of it from the second use and applying it to the first*".

Assumptions

1. The consumer is rational in the sense that he wants to get maximum satisfaction.
2. The utility of each commodity is measurable in cardinal numbers.
3. The marginal utility of money remains constant.
4. The income of the consumer is given.
5. There is perfect competition in the market
6. The prices of the commodities are given.
7. The law of diminishing marginal utility operates.

Explanation

The law can be explained with the help of an example. Suppose a consumer wants to spend his limited income on Apple and Orange. He is said to be in equilibrium, only when he gets maximum satisfaction with his limited income. Therefore, he will be in equilibrium, when,

$$\frac{\text{Marginal utility of Apple}}{\text{Price of Apple}} = \frac{\text{Marginal utility of Orange}}{\text{Price of Orange}} = K$$

i.e.,= $\frac{MU_A}{P_A} = \frac{MU_O}{P_O} = K$

Eg. $^{50}/_{10} = {}^{20}/_{4} = 5$

K- Constant Marginal Utility of Money

In view of this equilibrium, this Law is also called the "Law of Consumer's Equilibrium".

In case $\frac{MU_A}{P_A}$ is less than $\frac{MU_O}{P_O}$ he would transfer the money from Apple to Orange till it is equal. This process of substitution gives him maximum satisfaction both from Apple and Orange. Hence, this Law is also called "Law of Substitution". Eg. For Apple $^{50}/_{25} = 2$; for Orange $^{20}/_{4} = 5$. In such situation, spending more money on orange is wiser.

Table 2.2 The Law of Equi-Marginal Utility

Units of Commodities	Apple			Orange		
	Total Utility TU	Marginal Utility MU	$\frac{MU_A}{P_A}$	Total Utility TU	Marginal Utility MU	$\frac{MU_O}{P_O}$
1.	25	25	25/2 = 12.5	30	30	30/1 = 30
2.	45	20	20/2 = 10	41	11	11/1 = 11
3.	63	18	18/2 = 9	49	8	8/1 = 8
4.	78	15	15/2 = 7.5	54	5	5/1 = 5
5.	88	10	10/2 = 5	58	4	4/1 = 4
6.	92	4	4/2 = 2	61	3	3/1 = 3

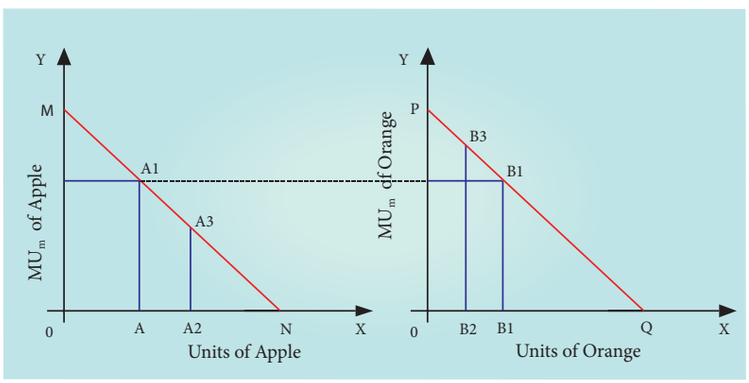


Diagram 2.2

Illustration

This Law can be illustrated with the help of table 2.2. Let us assume that the consumer has a given income of ₹14. He wants to spend this entire income (i.e., ₹14) on Apple and Orange. The price of an Apple is ₹2 and the price of an Orange is ₹1. This law can be illustrated with the help of Table 2.2

If the consumer wants to attain maximum utility, he should buy 5 units of

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apples and 4 units of oranges, so that he can get (88+54) 142 units of total utility.

Here $\frac{MU_A}{P_A} = \frac{MU_o}{P_O}$ ie, $\frac{10}{2} = \frac{5}{1} = 5$

Diagrammatic Illustration

In diagram 2.2, X axis represents the amount of money spent and Y axis represents the marginal utility of Apple and Orange respectively. If the consumer spends ₹10 on Apple and ₹4 on Orange, he will buy five apples and four oranges. The marginal utilities of both Apple and Orange are equal i.e.,AA_1=BB_1 (5=5). Hence, he gets maximum utility.

$A_2 A_3$ and $B_2 B_3$ lines have not been used for explanation.

Criticisms

1. In practice, utility cannot be measured, only be felt.
2. This Law cannot be applied to durable goods.

2.7 Consumer's Surplus

The concept of consumer surplus was originally introduced by classical economists and later modified by Jevons and Jule Dupuit, the French Engineer Economist in 1844. But a most refined form of the concept of consumer surplus was given by Alfred Marshall. This concept is based on the Law of Diminishing Marginal Utility.

Definition

Alfred Marshall defines consumer's surplus as, "the excess of the price which a person would be willing to pay rather than go without the thing, over that which he actually does pay is the economic measure of this surplus satisfaction. This may be called consumer's surplus".

Assumptions

1. Marshall assumed that utility can be measured.
2. The marginal utilities of money of the consumer remain constant.
3. There are no substitutes for the commodity in question.
4. The taste, income and character of the consumer do not change.
5. Utility of one commodity does not depend upon the other commodities.

Explanation

The concept of consumer's surplus can be explained with help of an example. Suppose a consumer wants to buy an apple. He is willing to pay ₹4, rather than go without it and the actual price of the apple is ₹2. Hence the consumer's surplus is ₹2(₹4 – ₹2). Thus, consumer's surplus is the difference between the price that a consumer is willing to pay (potential price) and what he actually pays. Therefore,

Consumer's surplus	=	What a person is willing to pay – What he actually pays.
	OR	
Consumer's surplus	=	Potential price– Actual price.

Mathematically,

Consumer's surplus = TU – (P x Q)

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Table 2.3 Consumer's Surplus

Units of commodity (Apple)	*Willingness to pay or Potential Price (Marginal Utility) (Rs)*	*Actual Price (Rs)*	*Consumer's Surplus = Potential Price – Actual Price (Rs)*
1	6	2	6 - 2 = 4
2	5	2	5 - 2 = 3
3	4	2	4 - 2= 2
4	3	2	3 - 2 = 1
5	2	2	2-2=0
Total	20	10	10

where,

TU = Total Utility, P = Price and Q= Quantity of the commodity

The measurement of consumer's surplus is illustrated in Table 2.3.

In Table 2.3 the consumer is willing to pay rupees 6, 5, 4, 3 and 2 for purchasing the successive units of apples. Hence, he is willing to pay (Potential Price Total Utility) ₹20 for 5 apples. But, he actually pays ₹10 (₹2 x 5)) for getting 5 apples. Hence,

Consumer's Surplus = Total Utility (Actual Price x units of Commodity)

= TU – (P x Q)

= 20 –(2 x 5)

= 20-10 = 10.

The concept of Consumer's Surplus can also be explained with the help of a diagram.

In the diagram 2.3, X axis shows the amount demanded and Y axis represents the price. DD1 shows the utility which the consumer derives from the purchase of different amounts of commodity. When price is OP, the amount demanded is OQ.

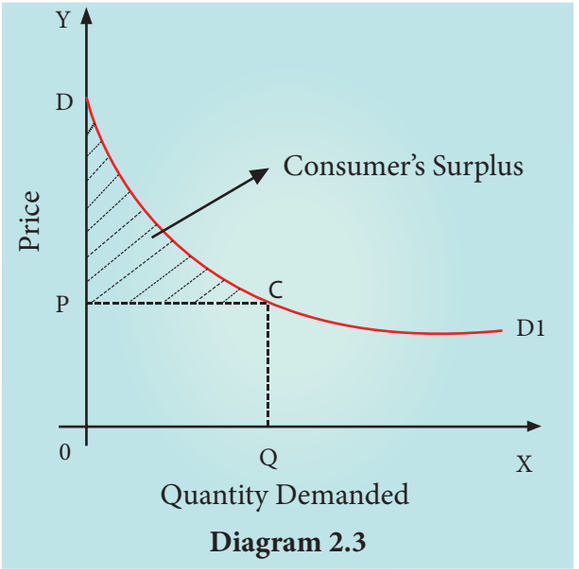


Diagram 2.3

Hence, actual price is OPCQ (OP x OQ). Potential Price (Total Utility) is ODCQ.

Therefore,

Consumer' Surplus = ODCQ – OPCQ

= 20-10 = 10

= PDC (the shaded area)

Criticism

1. Utility cannot be measured, because it is subjective.
2. Marginal utility of money does not remain constant.
3. Potential price is internal, it might be known to the consumer himself.

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2.8 Law of Demand

Demand is essential for the creation, survival and profitability of a firm. *"Demand in economics is the desire to possess something and the willingness and the ability to pay a certain price in order to possess it".*

–J. Harvey

"Demand in economics means desire backed up by enough money to pay for the good demanded"

–Stonier And Hague

2.8.1 Characteristics of Demand

- **Price** : Demand is always related to price.
- **Time** : Demand always means demand per unit of time, per day, per week, per month or per year.
- **Market** : Demand is always related to the market, buyers and sellers.
- **Amount**: Demand is always a specific quantity which a consumer is willing to purchase.

2.8.2 Demand Function

Demand depends upon price. This means demand for a commodity is a function of price. Demand function is mathematically denoted as,

D = f (P) where, D = Demand, f = function
P = Price

2.8.3 Law of Demand

The Law of Demand was first stated by Augustin Cournot in 1838. Later, it was refined and elaborated by Alfred Marshall.

Definitions

The Law of Demand says as "the quantity demanded increases with a fall in price and diminishes with a rise in price".

–Marshall

"The Law of Demand states that people will buy more at lower prices and buy less at higher prices, other things remaining the same".

- Samuelson

Assumptions of Law of Demand

1. The income of the consumer remains constant.
2. The taste, habit and preference of the consumer remain the same.
3. The prices of other related goods should not change.
4. There should be no substitutes for the commodity in study.
5. The demand for the commodity must be continuous.
6. There should not be any change in the quality of the commodity.

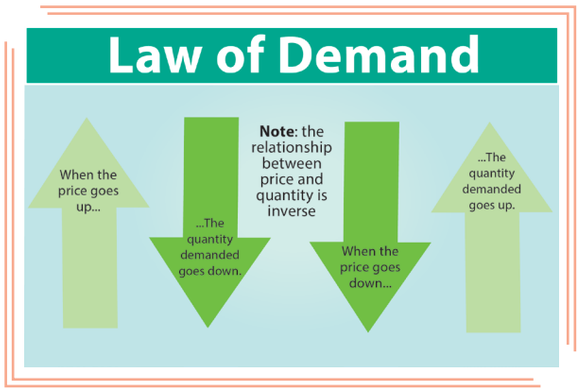
Given these assumptions, the law of demand operates. If there is change even in one of these assumptions, the law will not operate.

Table 2.4 Demand Schedule

Price (₹)	Quantity Demanded (Units)
5	1
4	2
3	3
2	4
1	5

Explanation

The law of demand explains the relationship between the price of a commodity and the quantity demanded of it. This law states



that quantity demanded of a commodity expands with a fall in price and contracts with a rise in price. In other words, a rise in price of a commodity is followed by a contraction in demand and a fall in price is followed by extension in demand. Therefore, the law of demand states that there is an inverse relationship between the price and the quantity demanded of a commodity.

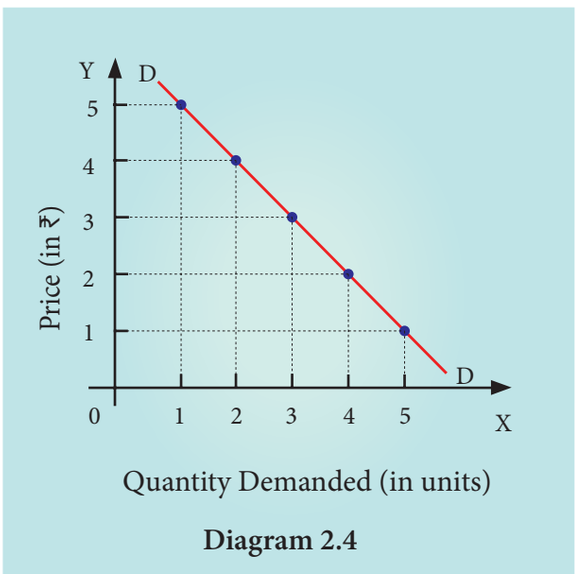


Diagram 2.4

In the diagram 2.4, X axis represents the quantity demanded and Y axis represents the price of the commodity. DD is the demand curve, which has a negative slope i.e., slope downward from left to right which indicates that when price falls, the demand expands and when price rises, the demand contracts.

Market Demand for a Commodity

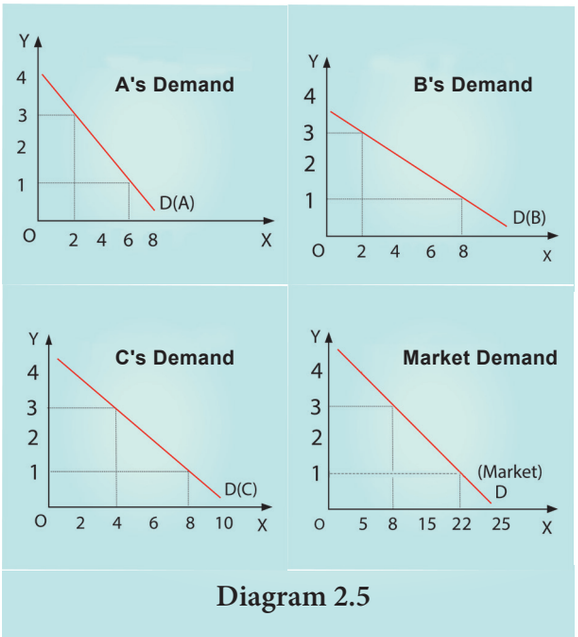


Diagram 2.5

The market demand curve for a commodity is derived by adding the quantum demanded of the commodity by all the individuals constituting the market. In the diagram given above, the final market demand curve represents the addition of the demand curve of the individuals A, B and C at the same price.

When Price is ₹3, the Market demand is 2+2+4 = 8

When Price is ₹1, the Market demand is 6+8+8 = 22

As in the case of individual demand schedule, the Market Demand Curve is at a price, at a place and at a time.

2.8.4 Determinants of Demand

1. ***Changes in Tastes and Fashions***: The demand for some goods and services

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is very susceptible to changes in tastes and fashions

2. ***Changes in Weather*:** An unusually dry summer results in increase in the demand for cool drinks.
3. ***Taxation and Subsidy:*** If fresh taxes are levied or the existing rates of taxation on commodities are increased their prices go up. The subsidies will bring down the prices. Therefore taxes reduce demand and subsidies raise demand.
4. ***Changes in Expectations:*** Expectations also bring about a change in demand. Expectation of rise in price in future results in increase in demand.
5. ***Changes in Savings:*** Savings and demand are inversely related.
6. ***State of Trade Activity*:** During the periods of boom and prosperity, the demand for all commodities tends to increase. On the contrary, during times of depression there is a general slackening of demand.
7. ***Advertisement:*** In advanced capitalistic countries advertising is a powerful instrument to increase the demand in the market.
8. ***Changes in Income:*** An increase in family income may increase the demand for durables like video recorders and refrigerators. Equal distribution of income enables poor to get more income. As a result consumption level increases.
9. ***Change in Population:*** The demand for goods depends on the size of population. An increase in population tends to increase the demand for goods and a decrease in population tends to decrease the demand (if other things remain constant).

2.8.5 Exceptions to the law of demand

Normally, the demand curve slopes downwards from left to right. But there are some unusual demand curves which do not obey the law and the reverse occurs. A fall in price brings about a contraction of demand and a rise in price results in an extension of demand. Therefore the demand curve slopes upwards from left to right. It is known as exceptional demand curve.

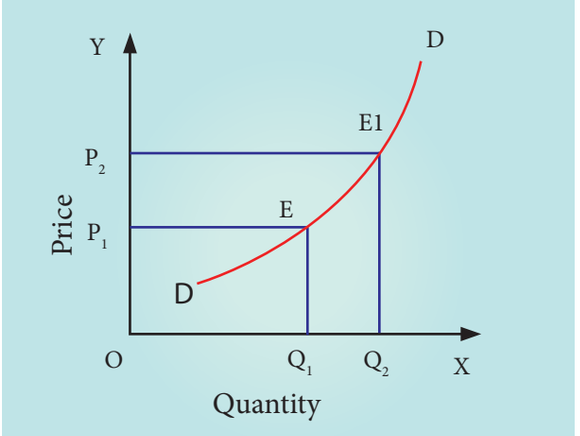


Diagram 2.6

In the diagram 2.6, DD is the demand curve which slopes upwards from left to right. It shows that when price is OP_1, OQ_1 is the demand and when the price rises to OP_2, demand also extends to OQ_2.

2.8.6 Reasons for Exceptional Demand Curve

1. **Giffen Paradox:** The Giffen good or inferior good is an exception to the law of demand. When the price of an inferior good falls, the poor will buy less and vice versa. For Example: Rice, Ragi

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2. **Veblen or Demonstration effect:** Veblen has explained the exceptional demand curve through his doctrine of conspicuous consumption. Rich people buy certain goods because it gives them social distinction or prestige. For example, diamonds.

3. **Ignorance**: Sometimes, the quality of the commodity is judged by it's price. Consumers think that the product is superior if the price is high. As such they buy more at a higher price.

4. **Speculative effect:** If the price of the commodity is increasing then the consumers will buy more of it because of the expectation that it will increase still further. Eg Gold.

5. **Fear of shortage:** During times of emergency or war, people may expect shortage of a commodity and so buy more.

2.8.7 Extension and Contraction of Demand

The changes in the quantity demanded for a commodity due to the change in its price alone are called "Extension and Contraction of Demand". In other words, buying more at a lower price and less at a higher price is known as "Extension and Contraction of Demand".

2.8.8 Movement along Demand Curve

In the diagram 2.7, at point A, the price OP_2 and quantity demanded is OQ_2. When price falls to OP_3 (movement along the demand curve A to C) the quantity demanded increases to OQ_3. If price rises

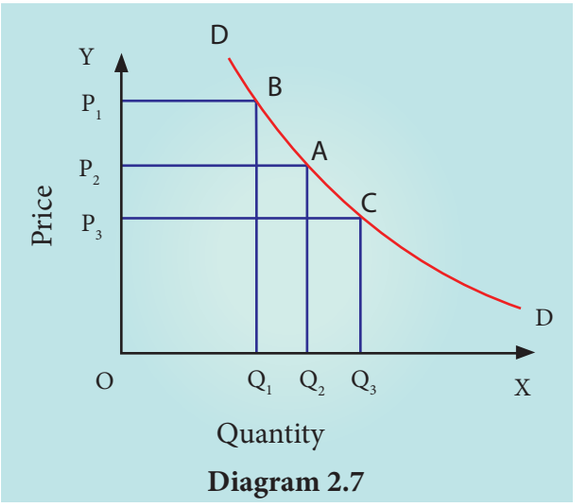


Diagram 2.7

to OP_1 (movement from A to B) quantity demanded decreases to OQ_1.

2.8.9 Shift in the Demand Curve

A shift in the demand curve occurs with a change in the value of a variable other than its price in the general demand function. An increase or decrease in demand due to changes in conditions of demand is shown by way of shifts in the demand curve.

On the left hand side of the diagram 2.8, the original demand curve is dd, the price is OP_1 and the quantity demanded is OQ_1. Due to change in the conditions of demand (change in income, taste or change in prices of substitutes and /or complements) the quantity demanded decreases from OQ_1 to OQ_2. This is shown in the shift of the demand curve to the left. The new demand curve is d_1d_1. This is called decrease in demand.

On the right hand side of the diagram 2.8, the original price is OP_1 and the quantity demanded is OQ_1 . Due to changes in other conditions, the quantity purchased has increased to OQ_2 . Thus the demand curve shifts to the right d_1d_1. This is called increase in demand.

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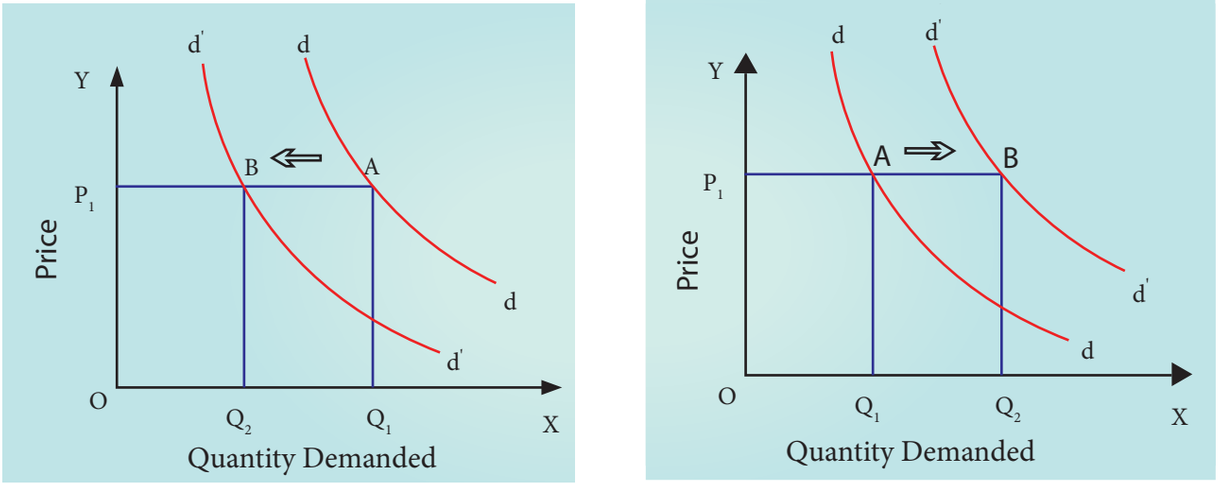


Diagram 2.8

'Extension' and 'Contraction' of demand follow a change in price. Increases and decreases in demand take place when price remains the same and the other factors bring about demand changes.

2.9 Elasticity of Demand

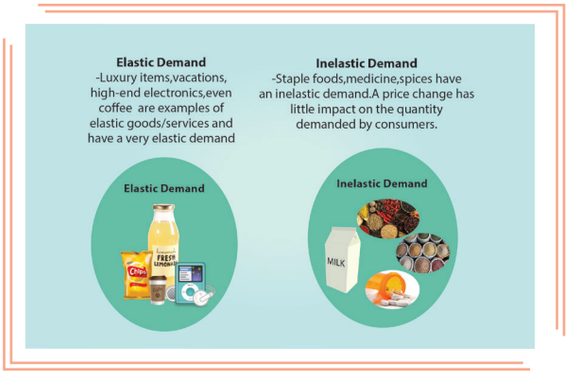
The Law of Demand explains the direction of change in demand due to change in the price. It fails to explain the rate of change in demand due to a given change in price. Elasticity of demand explains the rate of change in quantity demanded due to a given change in price.

"Elasticity of demand is, therefore, a technical term used by the Economists to describe the degree of responsiveness of the Quantity demand for a commodity to a change in its price".

- Stonier And Hague

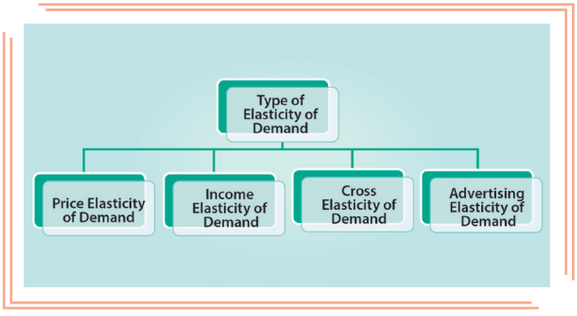
Elastic demand or More Elastic demand

Demand for a commodity is said to be "Elastic" when the quantity demanded increases by a large amount due to a little fall in the price and decreases by a large



amount due to a little rise in the price. To be more scientific, Elastic demand is called "More Elastic Demand".

2.9.1 Types of Elasticity of Demand



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Price Elasticity of Demand

Price elasticity of demand is commonly known as elasticity of demand. This is because price is the most influential factor affecting demand. "Elasticity of demand measures the responsiveness of the quantity demanded to changes in the price".

1. **Price Elasticity of Demand:** The price elasticity of demand, commonly known as the elasticity of demand refers to the responsiveness and sensitiveness of demand for a product to the changes in its price. In other words, the price elasticity of demand is equal to

$$E_p = \frac{\textit{Proportionate change in Quantity Demanded}}{\textit{Proportionate change in Price}}$$

Numerically,

$$E_p = \frac{\Delta Q}{\Delta P} X \frac{P}{Q}$$

ΔQ = changes in demand.

ΔP = changes in price.

P = original price.

Q = original quantity.

where, $\Delta Q = Q_1 - Q_0$, $\Delta P = P_1 - P_0$, Q_1 = New quantity,

Q_0 = Original quantity, P_1 = New price, P_0 = Original price.

2. **Income Elasticity of Demand:** Income is also a factor that influences the demand for a product. Hence, the degree of responsiveness of a change in demand for a product due to the change in income is known as income elasticity of demand. The formula to compute the income elasticity of demand is:

$$E_Y = \frac{\text{Proportionate change in Quantity of Demand for a product}}{\text{Proportionate change in Income}}$$

For most of the goods, the income elasticity of demand is greater than one indicating that with the change in income the demand will also change and that too in the same direction, i.e. more income means more demand and vice-versa.

3. **Cross Elasticity of Demand:** The cross elasticity of demand refers to the percentage change in quantity demanded for one commodity as a result of a small change in the price of another commodity. This type of elasticity usually arises in the case of the interrelated goods such as substitutes and complementary goods. The cross elasticity of demand for goods X and Y can be expressed as:

$$E_c = \frac{\textit{Proportionate change in demand for Commodity X}}{\textit{Proportionate change in price for Commodity Y}}$$

4. **Advertising Elasticity of Demand:** The responsiveness of the change in demand due to the change in advertising or other promotional expenses, is known as advertising elasticity of demand. It can be expressed as:

$$E_a = \frac{\textit{Proportionate change in Demand}}{\textit{Proportionate change in Advertising Expenditure}}$$

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2.9.2 Levels or Degrees of Price Elasticity of Demand

Definition: The **Price Elasticity of Demand** is commonly known as the elasticity of demand, which refers to the degree of responsiveness of demand to the change in the price of the commodity.

1. Perfectly Elastic Demand (Ep = ∞):

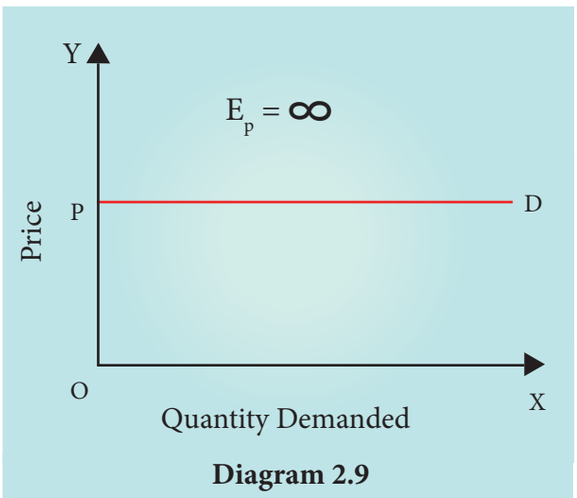


Diagram 2.9

The demand is said to be perfectly elastic when a slight change in the price of a commodity causes an infinite change in its quantity demanded. Such as, even a small rise in the price of a commodity can result in greater fall in demand even to zero. In some cases a little fall in the price can result in the increase in demand to infinity. In such perfectly elastic demand the demand curve is a **horizontal straight line** parallel to x axis.

2. Perfectly Inelastic Demand (Ep =0):

When there is no change in the demand for a product due to the change in the price, then the demand is said to be perfectly inelastic. Here, the demand curve is a **vertical straight line** which shows that the demand remains unchanged irrespective of change in the price., i.e. quantity OQ remains unchanged at different prices, P_1, P_2, and P_3.

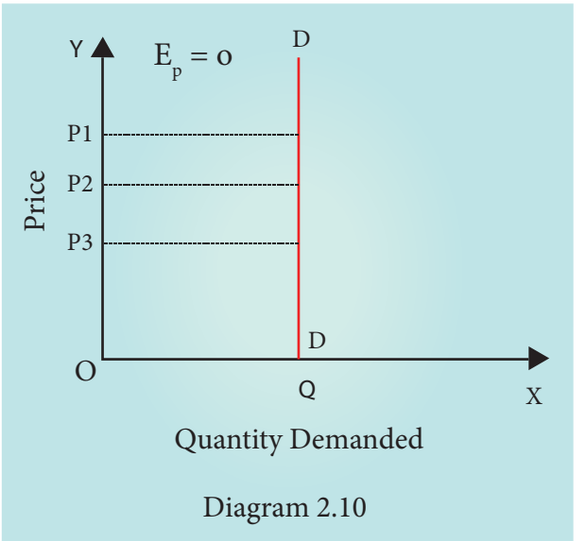


Diagram 2.10

3. Relatively Elastic Demand (E_p>1): The demand is relatively elastic when the proportionate change in the demand for a commodity is greater than the proportionate change in its price. Here, the demand curve is **gradually sloping** (flatter) which shows that a proportionate change in quantity from 5 to 10 is greater than the proportionate change in the price from 11 to 10. Change in demand is: $^{10-5}/_{5} \times 100 = 100\%$

Change in price =10%. Hence, it is more elastic demand.

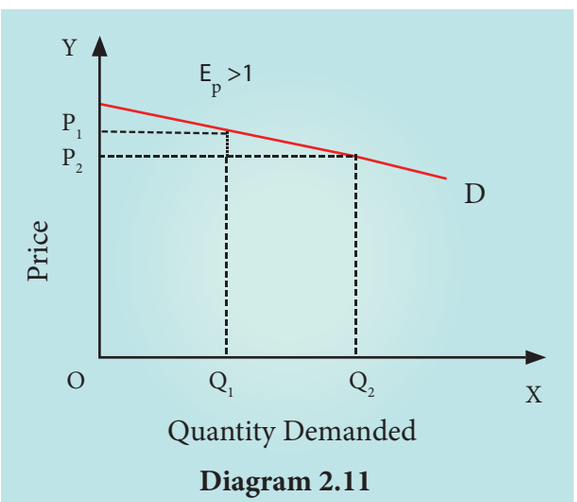


Diagram 2.11

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4. Relatively Inelastic Demand (E_p<1):

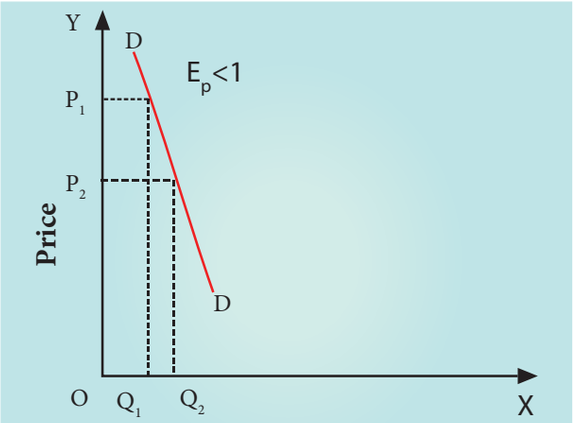


Diagram 2.12

When the proportionate change in the demand for a product is less than the proportionate change in the price, the demand is said to be relatively inelastic. It is also called the elasticity less than unity. Here the demand curve is steeply sloping, which shows that the change in to the quantity from OQ_1 to OQ_2 is relatively smaller than the change in the price from OP_1 to Op_2.

5. Unitary Elastic Demand (Ep =1):

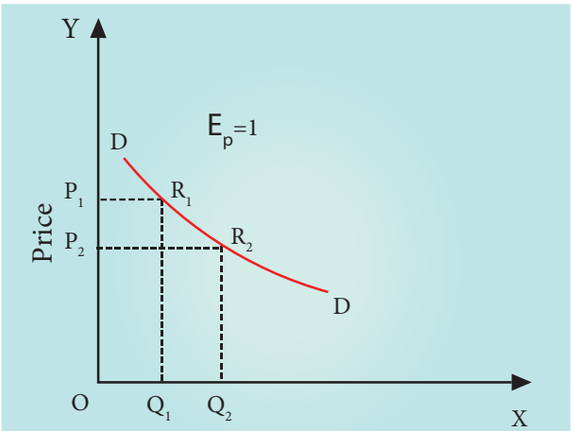


Diagram 2.13

The demand is unitary elastic when the proportionate change in the price of a product results in the same propionate change in the quantity demanded. Here the shape of the demand curve is a rectangular hyperbola, which shows that area under the curve is equal to one.

Here $OP_1\ R_1Q_1 = OP_2\ R_2Q_2$

or simply $P_1\ P_2 = Q_1\ Q_{2\ =}\ R_1\ P_2$

Table 2.5 Degrees of Price Elasticity of Demand

Numerical Value	*Terminology*	*Description*	*Shape of the Demand curve*
$e_p = \infty$	Perfectly elastic	Change in demand is infinite at a given price	Horizontal
$e_p = 0$	Perfectly inelastic	Demand remains unchanged whatever be the change in price	Vertical
$e_p = 1$	Unitary elastic	$\%\Delta Q = \%\Delta P$	Rectangular Hyperbola
$0 < e_p < 1$	Inelastic	$\%\Delta Q < \%\Delta P$	Steeper
$\infty > e_p > 1$	Elastic	$\%\Delta Q > \%\Delta P$	Flatter

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2.9.3. Determinants of Elasticity of Demand

There are many factors that determine the degree of price elasticity of demand. Some of them are described below:

a) Availability of Substitutes:

If close substitutes are available for a product, then the demand for that product tends to be very elastic. If the price of that product increases, buyers will buy its substitutes; hence fall in its demand will be very large. Hence, price elasticity will be larger. Eg. Vegetables.

For salt no close substitutes are available. Hence even if price of salt increases the fall in demand may be zero or less. Hence salt is price inelastic.

b) Proportion of consumer's income spent If a smaller proportion of consumer's income is spent on a particular commodity say X, price elasticity of demand for X will be smaller. Take for example salt, people spend very small proportion of their income on salt. Hence, salt will have small elasticity of demand, or inelastic.

c) Number of uses of commodity:

If a commodity is used for greater number of uses, its price elasticity will also be larger. For example, milk is used as butter milk, curd, ghee and for making ice cream etc. Hence, even the small fall in the price of milk, will tempt the consumers to use more milk for many purposes. Hence milk has greater price elasticity of demand.

d) Complementarity between goods:

For example, along with petrol, lubricating oil is also used for running automobiles. Here, a rise in the price of lubricating oil may not reduce the demand for lubricating oil. Hence, the complementary good, here, lubricating oil, will be price inelastic.

e) Time: In the long run, the price elasticity of demand for many goods will be larger. This is so because, in the long run many substitutes can be discovered or invented. Therefore, the demand is generally more elastic in the long run, than in the short run. In the short run bringing out new substitutes is difficult.

2.9.4 Measurement of Elasticity of Demand

There are three methods of measuring price elasticity of demand.

1. The Percentage Method

$$e_p = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

It is also known as ratio method, when we measure the ratio as:

$$e_p = \frac{\%\Delta Q}{\%\Delta P} \text{ where,}$$

$\%\Delta Q$= percentage change in demand

$\%\Delta P$ = Percentage change in price

2. Total Outlay Method

Marshall suggested that the simplest way to decide whether demand is elastic or inelastic is to examine the change in total outlay of the consumer or total revenue of the firm.

Total Revenue = (Price x Quantity Sold)

TR = (P x Q)

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Table 2.6 Total Outlay Method

Price	Quantity Demanded	Total Outlay	Elasticity
150	3	450	e > 1
125	4	500	e = 1
100	5	500	e <1
75	6	450	

Where there is inverse relation between Price and Total Outlay, demand is elastic. Direct relation means inelastic. Elasticity is unity when Total Outlay is constant.

3. Point or Geometrical Elasticity

When the falling demand curve is a straight line, it is said to be linear. Graphically, the point elasticity of a linear demand curve is shown by the ratio of the segments of the line to the right and to the left of the particular point.

$$\textit{Point Elasticity} = \frac{\text{Lower segment of the demand curve below the given point}}{\textit{Upper segment of the demand curve above the given point}}$$

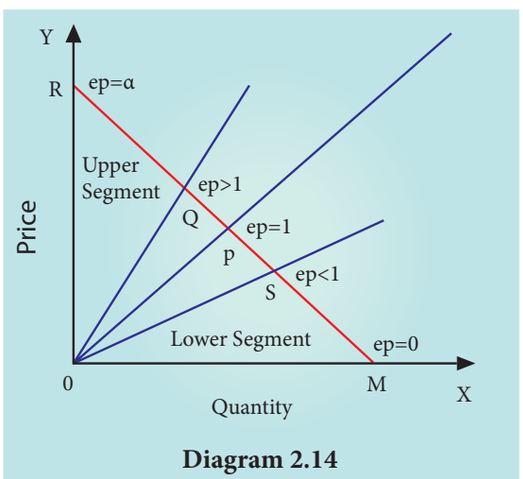


Diagram 2.14

$$e_p = \frac{L}{U} = \frac{\text{lower segment}}{\text{upper segment}}$$

Where 'e_p' stands for point elasticity, 'L' stands for the lower segment and 'U' for the upper segment.

2.9.5 Importance of Elasticity of Demand

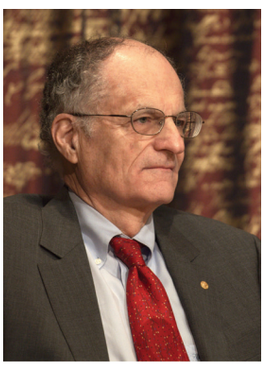
The concept of elasticity of demand is of much practical importance.

1. **Price fixation:** Each seller under monopoly and imperfect competition has to take into account elasticity of demand while fixing the price for his product. If the demand for the product is inelastic, he can fix a higher price.
2. **Production:** Producers generally decide their production level on the basis of demand for the product.
3. **Distribution:** Elasticity of demand also helps in the determination of rewards for factors of production.
4. **International trade**: Elasticity of demand helps in finding out the terms of trade between two countries. Terms of trade depends upon the elasticity of demand for the goods of the two countries.
5. **Public finance:** Elasticity of demand helps the government in formulating tax policies. For example, for imposing tax on a commodity.
6. **Nationalization:** The concept of elasticity of demand enables the government to decide over nationalization of industries.

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2.10 Ordinal Analysis (or) Ordinal Utility Approach (or) Hicks and Allen Approach (or) Indifference Curve Analysis

Introduction



R.G.D.Allen



J.R.Hicks

F.W.EdgeWorth (English Economist) and Vilfredo Pareto (Italian Economist) criticised the Cardinal Utility Approach. They assumed that utility cannot be measured absolutely, but can be compared or ranked or ordered by ordinal numbers such as I, II, III and so on. Edgeworth first developed a more scientific approach to the study of consumer behaviour, known as "Indifference Curve Approach" in1881. In 1906, Vilfredo Pareto modified the "Edgeworth Approach". Again J.R.Hicks and R.G.D.Allen refined the Indifference Curve Approach in 1934. Later, in 1939 J.R.Hicks in his book " Value and Capital" gave a final shape to this "Indifference Curve Analysis".

The theory of indifference curve was given by J. R. Hicks and R.G.D. Allen, 'A reconsideration of the theory of value', Economics in 1934.

Scale of Preference

This theory is also based on scale of preference. A rational consumer usually prefers that combination of goods which gives him maximum level of satisfaction. Thus, the consumer can arrange goods and their combination in order of their satisfaction. Such an arrangement of combination of goods in the order of level of satisfaction is called the "Scale of Preference".

Assumptions

1. The consumer is rational and his aim is to derive maximum satisfaction.
2. Utility cannot be cardinally measured, but can be ranked or compared or ordered by ordinal number such as I, II, III and so on.
3. The Indifference Curve Approach is based on the concept "Diminishing Marginal Rate of Substitution".
4. The consumer is consistent. This assumption is called the assumption of transitivity. If the consumer prefers combination A to B and B to C, then he should prefer A to C. If A>B and B>C, then A>C.

An Indifference Schedule

An indifference schedule may be defined as a schedule of various combinations of two commodities which will give the same level of satisfaction. In other words, Indifference Schedule is a table which shows the different combinations of two goods that give equal satisfaction to the consumer.

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Table 2.7: Indifference Schedule

Apple	*Oranges*	*Points*
1	20	R
2	15	S
3	12	T
4	10	U
5	9	V

Table 2.7 shows five combinations of two commodities Apple and Orange. Each of these combinations gives the consumer the same level of satisfaction without discrimination. In the schedule, the combinations are arranged in such a way that the consumer is indifferent towards the combinations. Hence, this schedule is called as, "Indifference Schedule". He will neither be better off nor worse off whichever combination he chooses.

2.11 An Indifference Curve

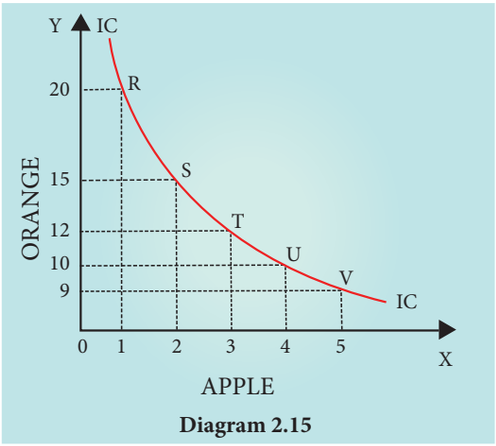


Diagram 2.15

Different combinations of two commodities (as found in Indifference Schedule) can be presented in a diagram. Then consumer gets different points and when such points are connected, a curve is obtained. The said curve is called as "Indifference Curve". Therefore, an indifference curve is the locus of all combinations of commodities from which the consumer derives the same level of satisfaction. It is also called "Iso-Utility Curve" or" Equal Satisfaction Curve". Indifference Curve is illustrated in diagram 2.15. X axis represents apple and Y axis represents orange. Point 'R' represents combination of 1 apple and 20 oranges, at 'S' 2 apples and 15 oranges and at 'T' 3 apples and 12 oranges. Similarly U,V points are obtained. These five points give the same level of satisfaction. The consumer will be neither better off nor worse off in choosing any one of these points. When one joins all these five points R, S, T, U, V one can get the Indifference Curve 'IC'.

2.12 An Indifference Map

One can draw several indifference curves each representing an indifference schedule. Hence, an Indifference Map is a family or collection or set of indifference curves corresponding to different levels of satisfaction. The Indifference Map is illustrated in Diagram 2.16.

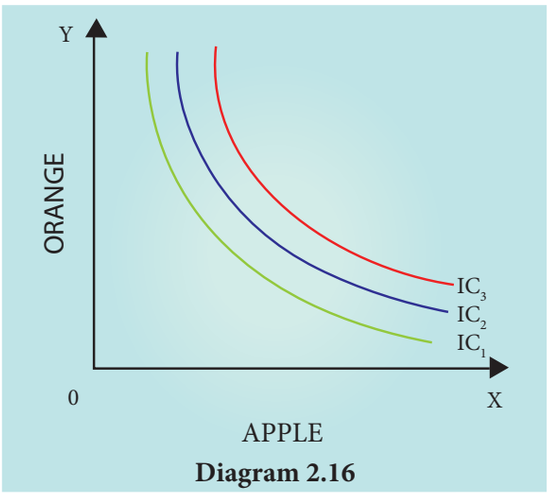


Diagram 2.16

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In the diagram 2.16, the indifference Curves IC_1, IC_2 and IC_3 represent the Indifference Map, Upper IC representing higher level of satisfaction compared to lower IC.

Marginal Rate of Substitution

The shape of an indifference curve provides useful information about preferences. Indifference curve replaces the concept of marginal utility with the concept of the marginal rate of substitution.

According to Leftwich "*The marginal rate of substitution of X for Y (MRS_{xy}) is defined as the maximum amount of Y the consumer is willing to give up for getting an additional unit of X and still remaining on the same indifference curve*".

2.13 Diminishing Marginal Rate of Substitution

It explains the concepts of diminishing marginal rate of substitution.

Since y decrease as X increases, the change in Y is negative i.e., $-\Delta y$, so the equation is

$$MRS_{xy} = -\frac{\Delta Y}{\Delta X} and$$

However, as with price elasticity of demand the convention is to ignore the minus sign. Therefore

$$MRS_{xy} = \frac{\Delta Y}{\Delta X}$$

2.14 Properties of the Indifference Curves

Indifference curves are subjective and unique to each person. Nevertheless they have in common the following properties:

1. **Indifference curve must have negative slope**

   An indifference curve has a negative slope, which denotes that if the quantity of commodity (y) decreases, the quantity of the other (x) must increase, if the

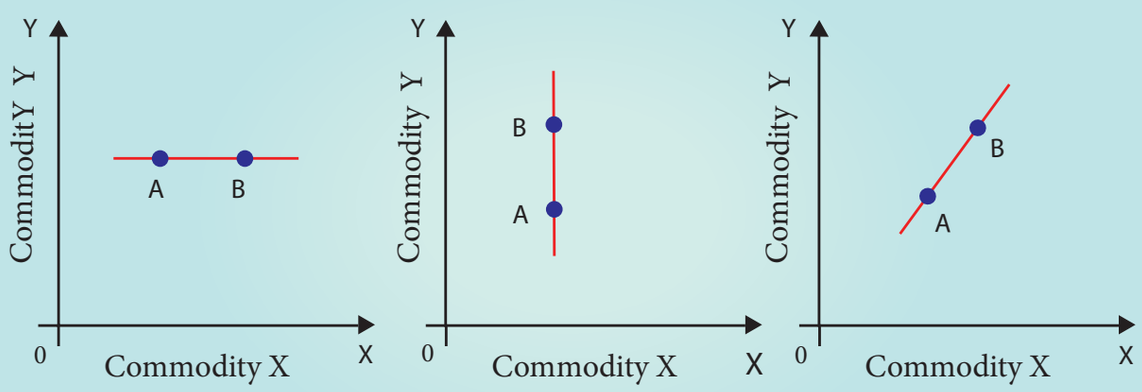


Diagram 2.17

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consumer is to stay on the same level of satisfaction. (a necessary consequence of the non satiety postulate).

The curves that do not have negative slopes such as those shown in diagram 2.17 cannot be indifference curves, in all three cases combination B is clearly preferable to combination A.

2. Indifference Curves are convex to the origin

Indifference curves are not only negatively sloped, but are also convex to the origin. The convexity of the indifference curves implies that not only the two commodities are substitutes for each other but also the fact that the marginal rate of substitution (MRS) between the goods decreases as a consumer moves along an indifference curve.

3. Indifference curve cannot intersect

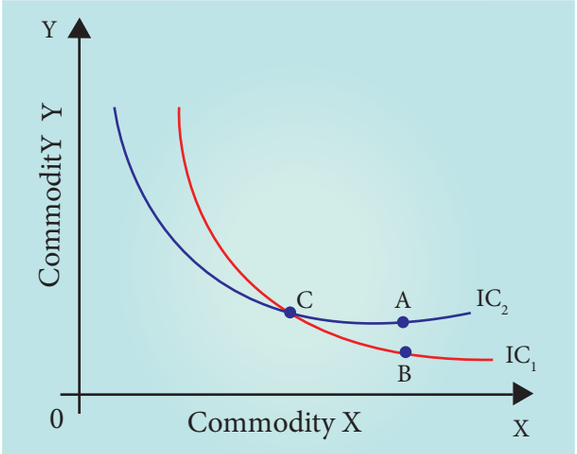


Diagram 2.18

IC_1 is lower indifference curve denoting lesser satisfaction. Combination C and B fall on IC_1.

IC_2 is upper indifference curve denoting higher satisfaction. C and A combinations are on IC_2.

At the point of intersection, C=B on IC_1 and C=A on IC_2. So A=B whereas, A is in upper IC and B is on lower IC. This is not possible.

4. Indifference curves do not touch the horizontal or vertical axis.

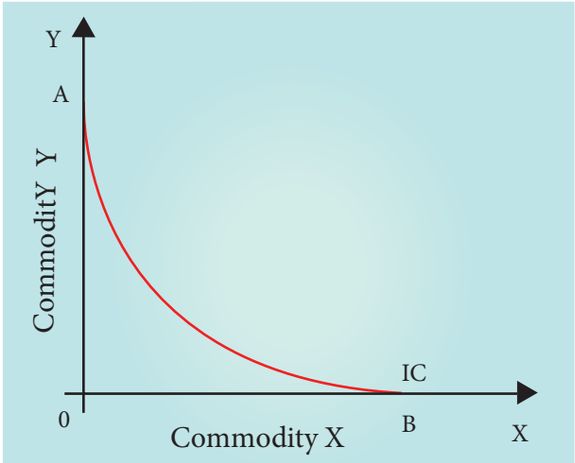


Diagram 2.19

If they touch the axis, it violates the basic assumption that the consumer purchases two commodities in a combination. Purchasing only one commodity means monomania that is consumers' lack of interest in the other commodity or his insistence on purchasing only one commodity.

2.15 Price line or Budget line

Demand for a good depends upon (i) preference for that good and (ii) purchasing power. The preference pattern is represented by set of indifference curves. The purchasing power depends on his money income and price of the goods. Money income and price level are represented by budget line. The budget

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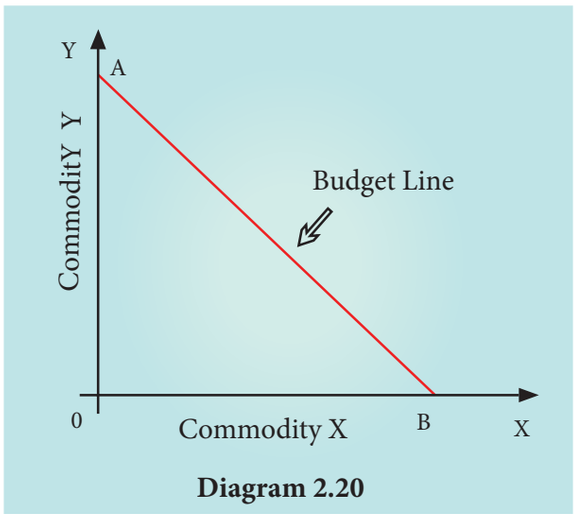


Diagram 2.20

line is a downward sloping straight line connecting X axis and Y axis as follows.

BA is the budget line with a given income (C). C/OA is the price of commodity Y and C/OB is the price of commodity X. The budget line is the line joining various combinations of the two goods which the consumer can buy at given prices and income.

2.16 Consumer Equilibrium

The consumer reaches equilibrium at the point where the budget line is tangent on the indifference curve.

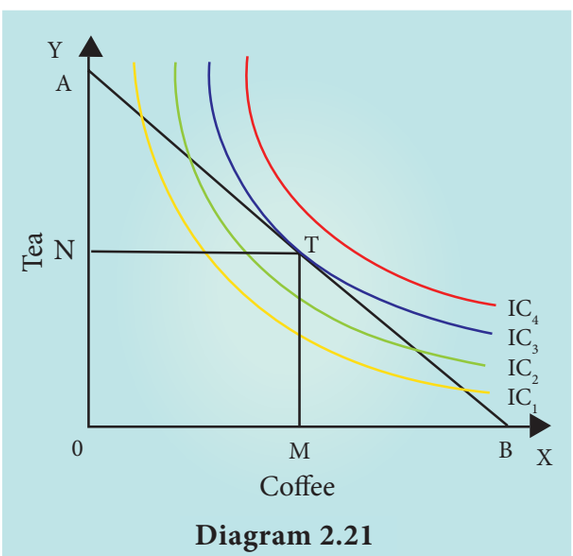


Diagram 2.21

T is the point of equilibrium as budget line AB is tangent on indifference curve IC_3 the upper IC which implies maximum possible level of satisfaction.

At equilibrium point, the slope of IC refers to MRS_{XY} and the slope of BL (Budget Line) refers to ratio of price of coffee X to price of tea Y ie P_x/P_y . Therefore $MRS_{x,y} = P_x/P_y$.

2.17 Conclusion

An understanding of consumer behaviour is an important part of comprehending the allocation of resources by individuals. Consumption decisions are made based upon a logical process of valuing utility, price and income alternatives. Demand analysis enables the producers to understand consumer behaviour and take proper decisions accordingly.

GLOSSARY

Consumption:	The use of goods and services for satisfying one's wants.
Demand:	Demand is desire backed by sufficient purchasing power and willingness to spend on a commodity.
Needs:	It is defined as goods or services that are required. This would include the needs for food, clothing, shelter and health care.

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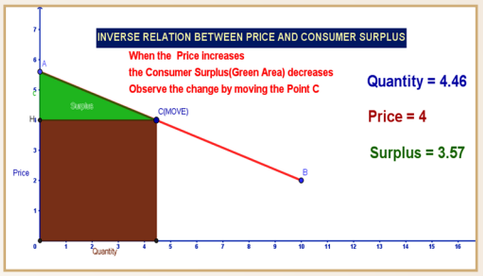
Utility:	Utility is the capacity of a commodity to satisfy human wants.
Marginal utility:	Marginal utility is the utility derived from the last or Marginal unit of consumption.
Elasticity of Demand:	The Elasticity of Demand refers to the rate of change in demand due to a given change in price.
Consumer's Surplus:	The difference between the potential price and actual price.
Indifference Curves:	ICs means all those combinations of any two goods which give equal satisfaction to the consumer.
Indifference Map:	A set of indifference curves upper ICs denoting higher levels of satisfaction and lower ICs lesser level of satisfaction.
Price line or Budget line:	The line joining various combination of the two goods which the consumer can buy at given prices and income.
Consumer's Equilibrium:	It refers to a situation under which a consumer spends his entire income on purchase of a goods in such a manner that it gives him maximum satisfaction and he has no tendency to change it.

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ICT CORNER

Inverse Relation Between Price and Consumer's Surplus

Inverse Relation helps in the study of Relation Between Price and Consumer's Surplus.



Steps:

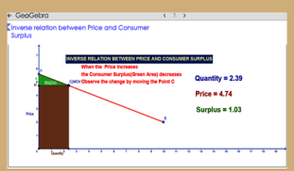
- Open the Browser type the URL given (or) Scan the QR Code.
- GeoGebra Work book called "XI STD ECONOMICS" will appear. In this several work sheets for Economics are given, Open the worksheet named "Inverse Relation Between Price and Consumer's Surplus"
- This work sheet is to give an Idea about the Consumer's Surplus and an Inverse relation. In this worksheet Green coloured triangle is the Consumer's Surplus. The vertical line shows the price and the Horizontal line shows the Quantity.
- Move the point C so that the triangle area is increased when the price is decreased and the triangle area is decreased when the price increases. This is called the Inverse relation between the price and Consumer's Surplus.



Step1



Step2



Step3



Step4

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MODEL QUESTIONS

Part-A Multiple Choice Questions

1. Pick the odd one out



   a. Luxuries
   b. Comforts
   c. Necessaries
   d. Agricultural goods

2. Choice is always constrained or limited by the _____ of our resources.
   a. Scarcity
   b. Supply
   c. Demand
   d. Abundance

3. The chief exponent of the Cardinal utility approach was
   a. J.R.Hicks
   b. R.G.D.Allen
   c. Marshall
   d. Stigler

4. Marginal Utility is measured by using the formula of
   a. TU_n-TU_{n-1}
   b. TUn-TU_{n+1}
   c. TU_n+TU_{n+1}
   d. TU_n-TU_{n+1}

5. When marginal utility reaches zero, the total utility will be
   a. Minimum
   b. Maximum
   c. Zero
   d. Negative

6. Gossen's first law is known as.
   a. Law of equi-marginal utility.
   b. Law of diminishing marginal utility
   c. Law of demand.
   d. Law of Diminishing returns.

7. The basis for the law of demand is related to
   a. Law of diminishing marginal utility
   b. Law of supply
   c. Law of equi-marginal utility.
   d. Gossen's Law.

8. The concept of consumer's surplus is associated with
   a. Adam Smith
   b. Marshall
   c. Robbins
   d. Ricardo

9. Given potential price is Rs.250 and the actual price is Rs.200. Find the consumer surplus.
   a. 375 b. 175
   c. 200 d. 50

10. Indifference curve approach is based on
   a. Ordinal approach
   b. Cardinal approach
   c. Subjective approach
   d. Psychological approach

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11. The concept of elasticity of demand was introduced by
    a. Ferguson
    b. Keynes
    c. Adam Smith
    d. Marshall

12. Increase in demand is caused by
    a. Increase in tax
    b. Higher subsidy
    c. Increase in interest rate
    d. decline in population

13. The movement on or along the given demand curve is known as_____
    a. Extension and contraction of demand.
    b. shifts in the demand.
    c. increase and decrease in demand.
    d. all the above

14. In case of relatively more elastic demand the shape of the curve is
    a. Horizontal
    b. Vertical
    c. Steeper
    d. Flatter

15. A consumer is in equilibrium when marginal utilities from two goods are
    a. Minimum
    b. Inverse
    c. Equal
    d. Increasing

16. Indifference curve was first introduced by
    a. Hicks
    b. Allen
    c. Keynes
    d. Edgeworth

17. Elasticity of demand is equal to one indicates
    a. Unitary Elastic Demand
    b. Perfectly Elastic Demand
    c. Perfectly Inelastic Demand
    d. Relatively Elastic Demand

18. The locus of the points which gives same level of satisfaction is associated with
    a. Indifference Curves
    b. Cardinal Analysis
    c. Law of Demand
    d. Law of Supply

19. Ordinal Utility can be measured by
    a. Ranking
    b. Numbering
    c. Wording
    d. None of these

20. The indifference curves are
    a. vertical
    b. horizontal
    c. positive sloped
    d. Negatively sloped

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Answers (Part- A)

1	2	3	4	5	6	7	8	9	10
d	a	c	a	b	b	a	b	d	a
11	12	13	14	15	16	17	18	19	20
d	b	a	d	c	d	a	a	a	d

Part-B Answer the following questions in one or two sentences.

21. Define Utility.
22. Mention the classifications of wants.
23. Name the basic approaches to consumer behaviour.
24. What are the degrees of price elasticity of Demand?
25. State the meaning of indifference curves.
26. Write the formula of consumers surplus.
27. What are Giffen goods? Why is it called so?

Part-C Answer the following questions in one paragraph.

28. Describe the feature of human wants.
29. Give the Marshall's definition of consumer surplus.
30. Explain the concept of consumer's equilibrium with a diagram.
31. Explain the theory of "consumer's surplus" .
32. Distinguish between extension and contraction of demand.
33. What are the properties of indifference curves?
34. Briefly explain the concept of consumer's equilibrium.

Part-D Answer the following questions in about a page

35. Explain the law of demand and its exceptions.
36. Elucidate the law of diminishing marginal utility with diagram.
37. Explain the law of Equi-marginal utility.
38. What are the methods of measuring Elasticity of demand?

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ACTIVITY

1. Prepare a budget line on the basis of your family income to purchase any two commodities.
2. Visit a vegetable market in your locality and write a report about the level of price and demand for a particular commodity over a period of time.

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CHAPTER

3 Production Analysis

"Production is any activity diverted to the satisfaction of other people's wants through exchange".

- J R Hicks

Learning Objectives

1. To understand the various factors of production and its characteristics.
2. To understand the short run and long run production function.
3. To understand the concept of supply.

3.1 Introduction

Production is a process of using various material and immaterial inputs in order to make output for consumption. Production process creates economic well-being. The satisfaction of needs originates from the output. Production is the result of cooperation of four factors of production (land, labour, capital and organisation). In Economics, production refers to the creation or addition of value. It simply transforms the inputs into output.

Production may be at varying levels. The scale of production influences the cost of production. All manufacturers are aware that when production of a commodity takes place on a larger scale, the average cost of its production is low. This is the reason why the entrepreneurs are interested in enlarging the scale of production of their commodities. They stand to benefit from the resulting economies of scale. There is also the possibility of making their products available in the market at lower prices.

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3.2 Features of the Factors of Production

Factors of production means resources used in the process of production of commodities. They are of four types viz., land, labour, capital and organization or enterprise. Here, land represents natural resources (such as soil, mineral deposits, seas, rivers, natural forests, fisheries etc). Labour represents human resources. Together, these two factors viz land and labour are called the *'primary factors of production'*.

These two factors produce some units of goods for the purpose of consumption. And as consumption of these goods takes place, there is the possibility of some of these goods getting left over. Thus, saving is production minus consumption. This saved amount is called capital, which serves as investment in the production process. Also, organisation or enterprise is a special form of labour. The third and fourth factors viz Capital and organisation are called *'secondary factors of production'*.

These four factors depend on each other. They have a coordinated impact on production of goods and services.

3.2.1 Land

In ordinary sense 'land' refers to the soil or the surface of the earth or ground. But, in Economics, land means all gifts of Nature owned and controlled by human beings which yield an income. Land is the original source of all material wealth. The economic prosperity of a country depends on the richness of her natural resources. The quality and quantity of agricultural



wealth are determined by the nature of soil, climate and rainfall. The agricultural products are the basis of trade and industry. Industry survives on the availability of coal-mines or waterfall for electricity production. Hence, all aspects of economic life like agriculture, trade and industry are generally influenced by natural resources which are called "Land" in economics.

Characteristics of Land

- Land is a primary factor of production.
- Land is a *passive* factor of production.
- Land is the free gift of Nature.
- Land has no cost of production.
- Land is fixed in supply. It is inelastic in supply.
- Land is permanent.
- Land is immovable.
- Land is heterogeneous as it differs in fertility.
- Land has alternative uses.
- Land is subject to Law of Diminishing Returns.

3.2.2 Labour

Labour is the active factor of production. In common parlance, labour means manual labour or unskilled work. But in Economics the term 'labour' has a wider

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meaning. It refers to any work undertaken for securing an income or reward. Such work may be manual or intellectual. For example, the work done by an agricultural worker or a cook or a rickshaw puller or a mason is manual. The work of a doctor or a teacher or an engineer is intellectual. In short, labour in economics refers to any type of work performed by a labourer for earning an income.

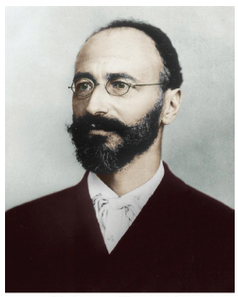
According to Marshall, labour represents services provided by the factor labour, which helps in yielding an income to the owner of the labour-power.

Characteristics of Labour

- Labour is the animate factor of production.
- Labour is an *active* factor of production.
- Labour implies several types: it may be manual (farmer) or intellectual (teacher, lawyer etc).
- Labour is perishable.
- Labour is inseparable from the Labourer.
- Labour is less mobile between places and occupations.
- Labour is a means as well as an end. It is both the cause of production and consumer of the product.
- Labour units are heterogeneous. Labour differs in ability.
- Labour-supply determines its reward (wage).
- Labour has weak bargaining power.
- Unspent labour at present cannot be stored up for future.

3.2.3 Capital




Bohm-Bawerk

Marshall says *"capital consists of all kinds of wealth other than free gifts of nature, which yield income"*. Bohm-Bawerk defines it as 'a produced means of production'. As said earlier, capital is a secondary means of production. It refers to that part of production which represents 'saving used as investment' in the further production process. For example, the entire mango is not eaten; a part of that (its nut) is used to produce more mangoes.

It is a stock concept. All capital is wealth but all wealth is not capital. For example, tractor is a capital asset which can be used in cultivation (production) of farm, but due to some reason the same is kept unused (idle) for some period. It cannot be termed as capital for that period. It is only wealth.

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Characteristics of Capital

- Capital is a man-made factor.
- Capital is mobile between places and persons.
- Capital is a passive factor of production.
- Capital's supply is elastic.
- Capital's demand is a derived demand.
- Capital is durable.
- Capital yields Income.
- Capital depriciates.

Capital may be tangible or intangible. For example, buildings, plants and machinery, factories, inventories of inputs, warehouses, roads, highways etc are tangible capital. The examples for intangible capital are investment on advertisement, expenses on training programme etc.

Financial Capital means the assets needed by a firm to provide goods and services measured in term of money value . It is normally raised through debt and equity issues .The prime aim of it is a mass to wealth in terms of profit.

3.2.4. *Organization*




Joseph Schumpeter

The man behind organizing the business is called 'Organizer' or 'Entrepreneur'. An organiser is the most important factor of production. He represents a special type of labour. Joseph Schumpeter says that an entrepreneur innovates, coordinates other factors of production, plans and runs a business. He not only runs the business, but also bears the risk of business. His reward is residual. This residual is either positive (profit) or negative (loss) or zero.

Functions of an Organizer (Entrepreneur)

- ***Initiation:*** An organizer is the initiator of the business, by considering the situation and availability of resources and planning the entire process of business or production.
- ***Innovation*:** A successful entrepreneur is always an innovator. He introduces new methods in the production process.
- ***Coordination:*** An organizer applies a particular combination of the factors of production to start and run the business or production.
- ***Control, Direction and Supervision:*** An organiser controls so that nothing prevents the organisation from achieving its goal. He directs the factors to get better results and supervises for the efficient functioning of all

An entrepreneur is a person who combines land, labour and capital in the production process to earn a profit.

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the factors involved in the process of production.

- ***Risk-taking and Uncertainty-bearing:*** There are risk-taking and uncertainty-functions for an entrepreneur bearing obstacles. Risks may be insured but uncertainties cannot be insured. They reduce the profit.

3.3 Production Function

Production function refers to the relationship among units of the factors of production (inputs) and the resultant quantity of a good produced (output).

According to George J. Stigler, *"Production function is the relationship between inputs of productive services per unit of time and outputs of product per unit of time."*



George J.Stigler

Production function may be expressed as: Q = f (N, L, K, T) Where, Q = Quantity of output, N = Land; L = Labour; K = Capital; and T = Technology. Depending on the efficiency of the producer, this production function varies.

The function implies that the level of output (Q) depends on the quantities of different inputs (N, L, K, T) available to the firm.

Short-run Production and Long run Production

In Micro economics, the distinction between long run and short run is made on the basis of fixed inputs that inhibit the production.

The short-run is the period where some inputs are variable, while others are fixed. Another feature is that new firms do not enter into the industry and existing firms may not leave the industry.

Long run, on the other hand, is the period featured by the entry of new firms to the industry and the exit of existing firms from the industry.

In general, Production function may be classified into two

- Short-run Production Function as illustrated by the Law of Variable Proportions.
- Long-run Production Function as explained by the Laws of Returns to Scale.

3.4 Law of Variable Proportions

The law states that if all other factors are fixed and one input is varied in the short run, the total output will increase at an increasing rate at first instance, be constant at a point and then eventually decrease. Marginal product will become negative at last.

According to G.Stigler, *"As equal increments of one input are added, the inputs of other productive services being held constant, beyond a certain point, the resulting increments of product will decrease, i.e., the marginal product will diminish".*

Assumptions

The Law of Variable Proportions is based on the following assumptions.

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- Only one factor is variable while others are held constant.
- All units of the variable factor are homogeneous.
- The product is measured in physical units.
- There is no change in the state of technology.
- There is no change in the price of the product.

Total Product (TP)

It refers to the total amount of commodity produced by the combination of all inputs in a given period of time.

- Summation of marginal products, i.e. **TP = ΣMP**

where, TP= Total Product, MP= Marginal Product

Average Product (AP)

It is the result of the total product divided by the total units of the input employed. In other words, it refers to the output per unit of the input.

Mathematically, ***AP = TP/N***

Where,

AP= Average Product

TP= Total Product

N= Total units of inputs employed

Marginal Product (MP)

It is the addition or the increment made to the total product when one more unit of the variable input is employed. In other words, it is the ratio of the change in the total product to the change in the units of the input. It is expressed as

$$MP=\Delta TP/\Delta N$$

where,

MP = Marginal Product

ΔTP = Change in total product

ΔN = Change in units of input

It is also expressed as

$$MP = TP\ (n) - TP\ (n\text{-}1)$$

Where,

MP = Marginal Product

TP(n) = Total product of employing n^{th} unit of a factor

TP(n-1) = Total product of employing the previous unit of a factor, that is, $(n\text{-}1)^{th}$ unit of a factor.

The Law of Variable Proportions is explained with the help of the following schedule and diagram:

In table 3.1, units of variable factor (labour) are employed along with other fixed factors of production. The table illustrates that there

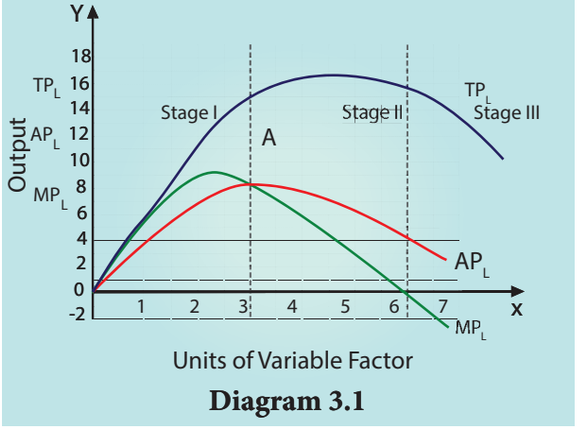


Diagram 3.1

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Table 3.1 Stages of Production

Units of variable factor (L)	Total Product (TP_L)	Marginal Product (MP_L)	Average Product (AP_L)	Stages
1	2	2	2	I
2	6	4	3	
3	12	6	4	
4	16	4	4	II
5	18	2	3.6	
6	18	0	3	III
7	16	-2	2.28	

are three stages of production. Though total product increases steadily at first instant, constant at the maximum point and then diminishes, it is always positive for ever. While total product increases, marginal product increases up to a point and then decreases. Total product increases up to the point where the marginal product is zero. When total product tends to diminish marginal product becomes negative.

In diagram 3.1, the number of workers is measured on X axis while TP_L, AP_L and MP_L are denoted on Y axis. The diagram explains the three stages of production as given in the above table.

Stage I

In the first stage MP_L increases up to third labourer and it is higher than the average product, so that total product is increasing at an increasing rate. The tendency of total product to increase at an increasing rate stops at the point A and it begins to increase at a decreasing rate. This point is known as ***'Point of Inflexion'***.

Stage II

In the second stage, MP_L decreases up to sixth unit of labour where MP_L curve intersects the X-axis. At third unit of labour $MP_L = AP_L$. After this, MP_L curve is lower than the AP_L. TP_L increases at a decreasing rate.

Stage III

Third stage of production shows that the sixth unit of labour is marked by negative MP_L, the AP_L continues to fall but remains positive. After the sixth unit, TP_L declines with the employment of more units of variable factor, labour.

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Relationship among Total, Average and Marginal Products

Stages	Total Product	Marginal Product	Average Product
Stage I	Initially it increases at an increasing rate and then increases at a decreasing rate	At the beginning it increases, then reaches a maximum and starts to decrease	At the first instant it increases, then attains maximum
Stage II	It continues to increase at a diminishing rate and reaches maximum.	It continues to diminish and becomes equal to zero	It is equal to MP and then begins to diminish
Stage III	It diminishes	It becomes negative	It continues to diminish but always greater than zero (positive)

3.5 Laws of Returns to Scale

In the long- run, there is no fixed factor; all factors are variable. The laws of returns to scale explain the relationship between output and the scale of inputs in the long-run when all the inputs are increased in the same proportion.

Assumptions

Laws of Returns to Scale are based on the following assumptions.

- All the factors of production (such as land, labour and capital) are variable but organization is fixed.
- There is no change in technology.
- There is perfect competition in the market.
- Outputs or returns are measured in physical quantities.

Three Phases of Returns to Scale

(1) Increasing Returns to Scale:

In this case if all inputs are increased by one percent, output increase by more than one percent.

(2) Constant Returns to Scale:

In this case if all inputs are increased by one percent, output increases exactly by one percent.

(3) Diminishing Returns to Scale:

In this case if all inputs are increased by one percent, output increases by less than one percent.

Diagrammatic Illustration

The three laws of returns to scale can be explained with the help of the diagram below.

In the diagram 3.2, the movement from point **a** to point **b** represents

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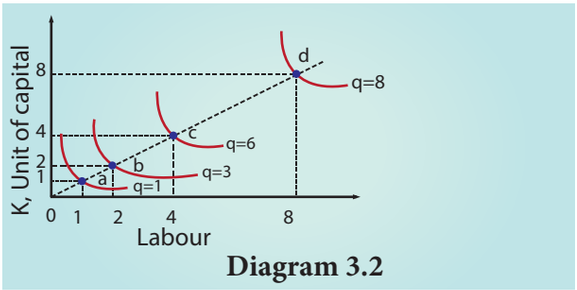


Diagram 3.2

Stages	Input	Output	Returns to Scale
a to b	100% ↑	200% ↑	Increasing
b to c	100% ↑	100% ↑	Constant
c to d	100% ↑	33.33% ↑	Decreasing

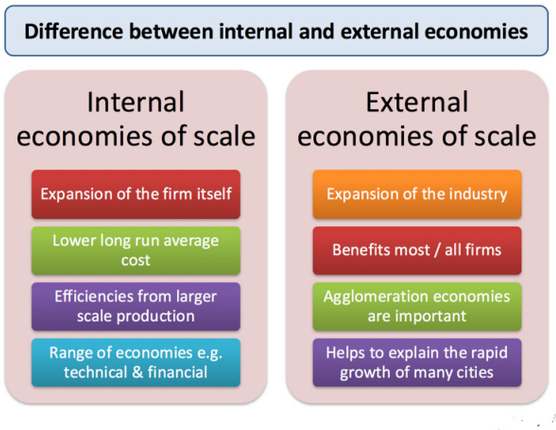
increasing returns to scale. Because, between these two points input has doubled, but output has tripled.

The law of constant returns to scale is implied by the movement from the point ***b*** to point ***c***. Because, between these two points inputs have doubled and output also has doubled.

Decreasing returns to scale are denoted by the movement from the point **c** to point **d** since doubling the factors from 4 units to 8 units produces less than the increase in inputs, that is, by only 33.33%

3.6 Economies of Scale

'Scale of Production' refers to the ratio of factors of production. This ratio can change because of availability of factors. The Scale of Production is an important factor affecting the cost of production. Every producer wishes to reduce the costs of production. Hence he (he includes she as well) uses an advantage of economy of scale. This economy of scale is effected both



by the internal and external factors of the firm. Accordingly, Economies are broadly divided into two types by Marshall.

1. Internal Economies and
2. External Economies

Economies of scale reduces the cost of production: and, diseconomies of scale increases the cost of production.

3.6.1 Internal Economies of Scale

‹The term Internal Economies of Scale› refers to the advantages enjoyed by a single production unit or firm which causes a reduction in the cost of production of the commodity. For example, a firm enjoying the advantage of application of most modern machinery, generation of internal capital, an improvement in managerial skill etc. is sure to reduce the cost of production. Internal economies are of various types:

- ***Technical Economies:*** When the size of the firm is large, large amount of capital can be used. There is a possibility to introduce up-to-date technologies; this improves productivity of the firm. Here research and development strategies can be applied easily.

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- ***Financial Economies*:** Big firms can float shares in the market for capital expansion, while small firms cannot easily float shares in the market.
- ***Managerial Economies*:** Large scale production facilitates specialisation and delegation.
- ***Labour Economies*:** Large scale production implies greater and minute division of labour. This leads to specialisation which enhances the quality. This increases the productivity of the firm.
- ***Marketing Economies*:** In the context of large scale production, the producers can both buy raw-materials in bulk at cheaper cost and can take the products to distant markets. They enjoy a huge bargaining power.
- ***Economies of Survival*:** Product diversification is possible when there is large scale production. This reduces the risk in production. Even if the market for one product collapses, market for other commodities offsets it.

3.6.2 External Economies of Scale

External Economies of Scale refer to changes in any factor outside the firm causing an improvement in the production process. This can take place in the case of industry also. These are the advantages enjoyed by all the firms in the industry due to the structural growth. Important external economies of scale are listed below.

1. *Increased transport facilities*
2. *Banking facilities*
3. *Development of townships*
4. *Development of information and communication*

3.7 Diseconomies of Scale

The diseconomies of scale are a disadvantage to a firm or an industry or an organisation. This necessarily increases the cost of production of a commodity or service. Further it delays the speed of the supply of the product to the market. These diseconomies are of two types:

a) *Internal Diseconomies of Scale: and*
b) *External Diseconomies of Scale*

3.7.1 Internal Diseconomies of Scale

When the scale of production increases beyond optimum limit, its efficiency may come down.

3.7.2 External Diseconomies of Scale

The term "External diseconomies of scale" refers to the threat or disturbance to a firm or an industry from factor lying outside it. For example a bus strike prevents the easy and correct entry of the workers into a firm. Similarly the rent of a firm increases very much if new economic units are established in the locality.

3.8 Iso-quants

Production function may involve, at a time, the use of more than one variable input. This is presented with the help of

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iso-quant curves. The two words 'Iso' and 'quant' are derived from the Greek language, meaning 'equal' and 'quantity' respectively. In our presentation only two factors, labour and capital are used.

In Economics, an iso-quant is a curve drawn by joining the combinations of changing the quantities of two or more inputs which give the same level of output. Isoquants are similar to indifference curves.

An iso-quant curve can be defined as the locus of points representing various combinations of two inputs capital and labour yielding the same output. The iso-quant is also called as the "*Equal Product Curve*" or the "*Product Indifference Curve*"

3.8.1 Definition of Iso-quant

According to Ferguson, "*An iso-quant is a curve showing all possible combinations of inputs physically capable of producing a given level of output*"

Iso-quants are based on the following assumptions.

1. It is assumed that only two factors are used to produce a commodity.
2. Factors of production can be divided into small parts.
3. Technique of production is constant.
4. The substitution between the two factors is technically possible. That is, production function is of 'variable proportion' type rather than fixed proportion.
5. Under the given technique, factors of production can be used with maximum efficiency.

Iso-quant Schedule

Let us suppose that there are two factors namely., labour and capital. An Iso-quant schedule shows the different combinations of these two inputs that yield the same level of output. It is given below.

Table 3.2 Iso-quant

Combination	Units of Labour	Units of Capital	Output of Cloth (meters)
A	2	30	400
B	4	22	400
C	6	16	400
D	8	12	400
E	10	10	400

It is seen from the table 3.2 that the five combinations of labour units and units of capital yield the same level of output, i.e., 400 meters of cloth.

3.8.2 Iso-quant Curve

An equal product curve represents all those combinations of two inputs which

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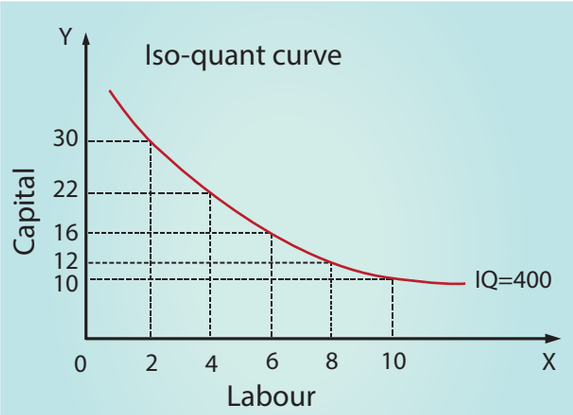


Diagram 3.3

are capable of producing the same level of output. An iso-product curve can be drawn with the help of isoquant schedule.

3.8.3 Iso-quant Map

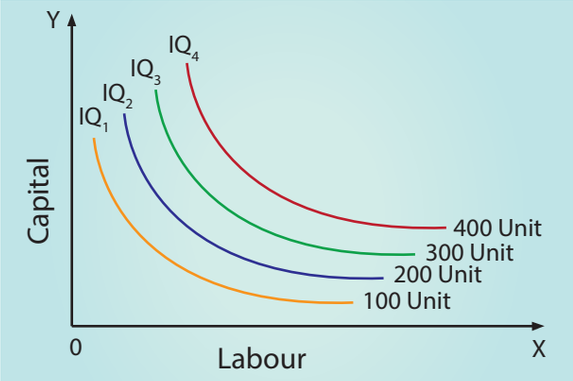


Diagram 3.4

An iso-quant map has different iso-quant curves representing the different combinations of factors of production, yielding different levels of output. In simple terms, an iso-quant map is a family of iso-quants. In other words, if more than one iso-quant is drawn in a diagram, it is called iso-quant map.

3.8.4 Properties of Iso-quant Curve

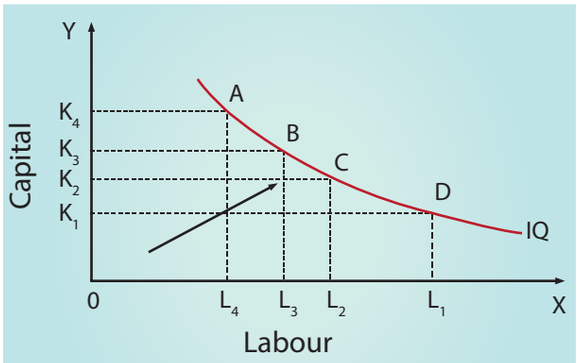


Diagram 3.5

1. ***The iso-quant curve has negative slope***. It slopes downwards from left to right indicating that the factors are substitutable. If more of one factor is used, less of the other factor is needed for producing the same level of output.

   In the diagram combination A refers to more of capital K_4 and less of labour L_4. As the producer moves to B, C, and D, more labour and less capital are used.

2. ***Convex to the origin.***

   This explains the concept of diminishing Marginal Rate of Technical Substitution ($MRTS_{LK}$). For example, the capital substituted by 1 unit of labour goes on decreasing when moved from top to bottom. If so, it is called diminishing MRTS. Constant MRTS (straight line) and increasing MRTS (concave) are also possible. It depends on the nature of iso-quant curve.

   This means that factors of production are substitutable to each other. The capital substituted per

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MARGINAL RATE OF TECHNICAL SUBSTITUTION

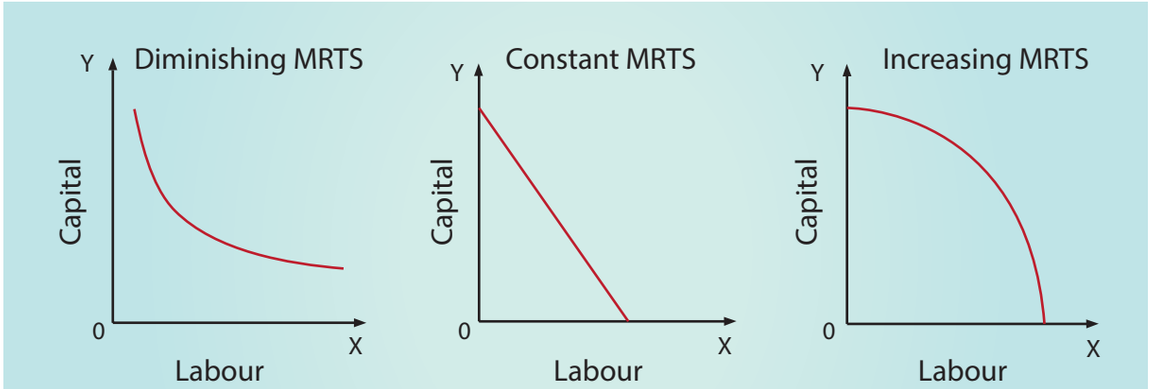


Diagram 3.6

unit of labour goes on decreasing when the iso-quant is convex to the origin.

3. **Non inter-section of Iso-quant curves.**

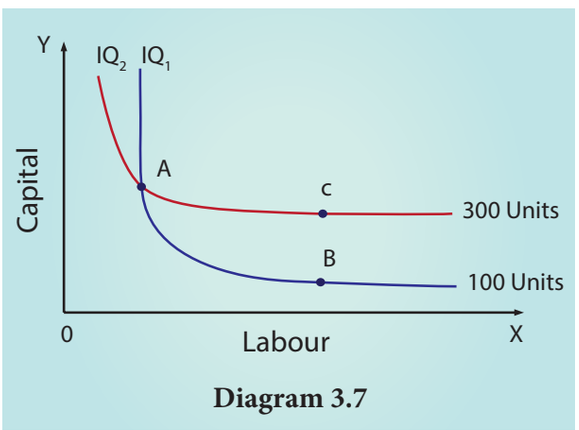


Diagram 3.7

For instance, point A lie on the iso-quants IQ_1 and IQ_2. But the point C shows a higher output and the point B shows a lower level of output IQ. If C=A, B=A, then C=B. But C>B which is illogical.

4. **An *upper iso-quant curve represents a higher level of output*.**

Higher IQ_2 shows higher outputs and lower IQ_1 show lower outputs, for upper iso-quant curve implies the use of more factors than the lower isoquant curve.

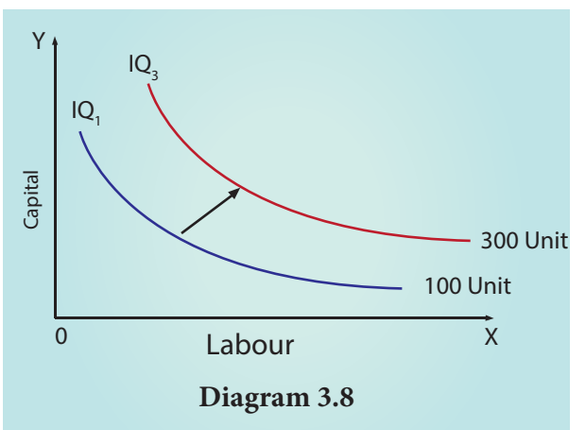


Diagram 3.8

The arrow in the figure shows an increase in the output with a right and upward shift of an iso-quant curve.

5. ***Iso-quant curve does not touch either X axis or Y axis.***

No iso-quant curve touches the X axis or Y axis because in IQ_1, only capital is used, and in IQ_2 only labour is used.

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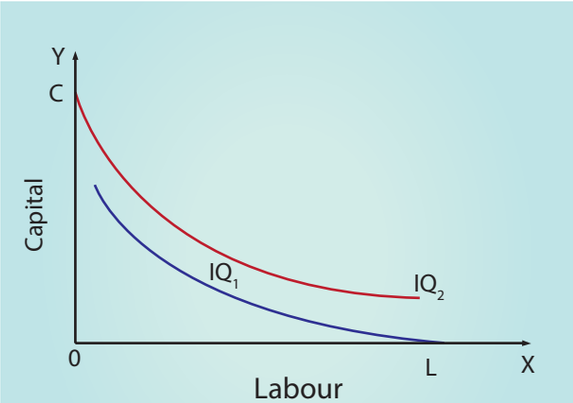


Diagram 3.9

3.9 The Iso-cost Line

The iso-cost line is an important component in analysing producer's behaviour. The iso-cost line illustrates all the possible combinations of two factors that can be used at given costs and for a given producer's budget. Simply stated, an iso-cost line represents different combinations of inputs which shows the same amount of cost. The iso-cost line gives information on factor prices and financial resources of the firm. It is otherwise called "iso-price line" or "iso-income line" or "iso-expenditure line" or "total outlay curve".

Suppose that a producer has a total budget of ₹120 and for producing a certain level of output, he has to spend this amount on two factors Labour (L) and Capital (K). Prices of factors K is ₹30 and L is ₹10. Iso Cost Curve can be drawn by using the following hypothetical table.

As shown in Table 3.10, there are five combinations of capital and labour such as combination A represents 4 units of capital and zero units of labour and this combination costs ₹120. Similarly other combinations (B,C,D and E) show the same cost or same expenditure (₹120).

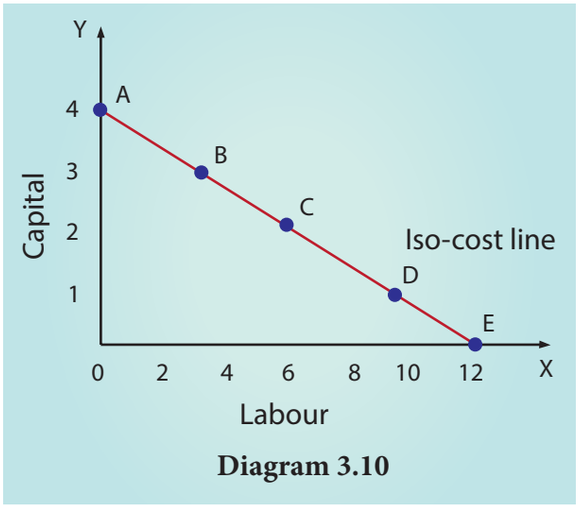


Diagram 3.10

Table 3.3 The Iso-cost

Combinations	Units of Capital Price = ₹30	Units of Labour Price = ₹10	Total Expenditure (in Rupees)
A	4	0	120
B	3	3	120
C	2	6	120
D	1	9	120
E	0	12	120

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Symbolically,

4K + 0L= ₹.120

3K + 3L= ₹.120

2K + 6L= ₹.120

1K + 9L= ₹.120, and

0K + 12L= ₹.120.

Thus, all the combinations A, B, C, D and E cost the same total expenditure.

From the diagram 3.10, it is shown that the costs to be incurred on capital and labour are represented by the triangle OAE. The line AE is called Iso-cost line.

3.10 Producer's Equilibrium

Producer equilibrium implies the situation where producer maximizes his output. It is also known as *optimum combination of the factors of production.* In short, the producer manufactures a given amount of output with *'least cost combination of factors'*, with his given budget.

Optimum Combination of Factors implies either

- there is output maximisation for given inputs or
- there is cost minimisation for the given output.

Conditions for Producer's Equilibrium

The two conditions that are to be fulfilled for the attainment of producer's equilibrium are:

- The iso-cost line must be tangent to iso-quant curve.
- At point of tangency, the iso-quant curve must be convex to the origin or $MRTS_{Lk}$ must be declining.

When the outlay and prices of two factors, namely, labour and capital are given, producers attain equilibrium (or least cost combination of factors is attained by the firm) where the iso-cost line is tangent to an iso-product curve. It is illustrated in the following Diagram 3.11.

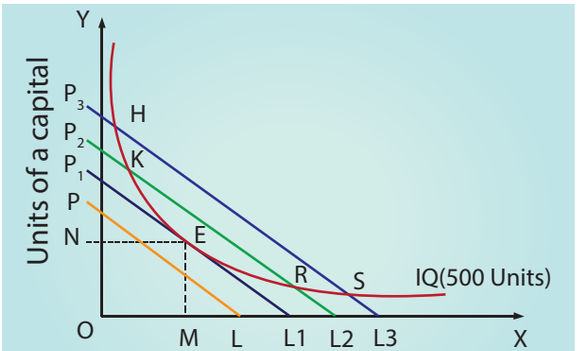


Diagram 3.11

In the above diagram, profit of the firm (or the producer) is maximised at the point of equilibrium E.

At the point of equilibrium, the slope of the iso cost line is equal to the slope of iso product curve (or the MRTS of labour for capital is equal to the price ratio of the two factors)

Hence, it can be stated as follows.

$$MRTS_{L,K} = \frac{P_L}{P_K} = 10/30 = 1/3 = 0.333$$

At point E, the firm employs OM units of labour and ON units of capital. In other words, it obtains least cost combination or optimum combination of the two factors to produce the level of output denoted by the iso-quant IQ.

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The other points such as H, K, R and S lie on higher iso cost lines indicating that a larger outlay is required, which exceeds the financial resources of the firm.

3.11 Cobb-Douglas Production Function



W.Cobb and Paul H.Douglas

Cobb-Douglas Production Function is a specific standard equation applied to describe how much output can be made with capital and labour inputs. It is used in empirical studies of manufacturing industries and in inter-industry comparisons. The relative shares of labour and capital in total output can also be determined. It is still used in the analysis of economies of modern, developed and stable nations in the world.

The Cobb-Douglas Production Function was developed by Charles W. Cobb and Paul H. Douglas, based on their empirical study of American manufacturing industry. It is a linear homogeneous production function which implies that the factors of production can be substituted for one another up to a certain extent only.

The Cobb-Douglas production function can be expressed as follows.

$$Q = AL^{\alpha} K^{ß}$$

Where, Q = output; A = positive constant; K = capital; L = Labor α and β are positive fractions showing, the elasticity coefficients of outputs for the inputs labor and capital, respectively.

ß = (1- α) since α + ß = 1. denoting constant returns to scale.

Factor intensity can be measured by the ratio ß / α.

The sum of α + ß shows the returns to scale.

i) (α + ß) =1, constant returns to scale.

ii) (α + ß) <1, diminishing returns to scale.

iii) (α + ß) >1, increasing returns to scale.

- The production function explains that with the proportionate increase in the factors, the output also increases in the same proportion.
- Cobb-Douglas production function implies constant returns to scale.
- Cobb-Douglas Production Function is a specific standard equation applied to describe how much output can be made with capital and labour inputs. It is used in empirical studies of manufacturing industries and in inter-industry comparisons. The relative shares of labour and capital in total output can also be determined. It is still used in the analysis of economies of modern, developed and stable nations in the world.
- Cobb-Douglas production function considered only two factors like labour

and capital. Production takes place only when both factors are employed.

- If production has to be equal to one Labour contributes three-fourth of production and capital contributes one-fourth of production.
- The elasticity of substitution between the factors is equal to one.

3.12 Law of Supply

Law of Supply is associated with production analysis. It explains the positive relationship between the price of a commodity and the supply of that commodity. For example, if the price of cloth increases, the supply of cloth will also increase. This is due to the fact that when price rises, it is profitable to increase the production and hence supply increases.

> Law of Supply describes a direct relation between price of a good and the supply of that good.

Definition

The Law of Supply can be stated as:

"*Other things remaining the same, if the price of a commodity increases its quantity supplied increases and if the price of a commodity decreases, quantity supplied also decreases*".

3.12.1 Supply Function

The supply of a commodity depends on the factors such as price of commodity, price of labour, price of capital, the state of technology, number of firms, prices of related goods, and future price expectations and so on. Mathematically the supply function is

$$Q_s = f(P_x, P_r, P_f, T, O, E)$$

Where Q_s = Quantity supplied of x commodity

P_x = Price of x Commodity

P_r = Price of related goods

P_f = Price of factors of production

T = Technology

O = Objective of the producer

E = Expected Price of the commodity.

Assumptions

Law of Supply is based on the following assumptions.

- There is no change in the prices of factors of production
- There is no change in the price of capital goods
- Natural resources and their availability remain the same
- Prices of substitutes are constant
- There is no change in technology
- Climate remains unchanged
- Political situations remain unchanged
- There is no change in tax policy

Explanation

Suppose that the supply function is

$$\mathbf{Q_s = f(P) \text{ or } Q = 20P}$$

P is an independent variable. When its value changes, new values of Q_s can be calculated.

Supply Schedule

A supply schedule shows the different quantities of supply at different prices.

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This information is given in the supply schedule given below.

Table 3.4 Price and Supply

Price (P)	Supply (Q_s)
1	20
2	40
3	60
4	80
5	100

$Q_s = 20P$

3.12.2 Supply Curve

A supply curve represents the data given in the supply schedule. As the price of the commodity increases, the quantum supplied of the commodity also increases. Thus the supply curve has a positive slope from left to right. (see diagram 3.12.)

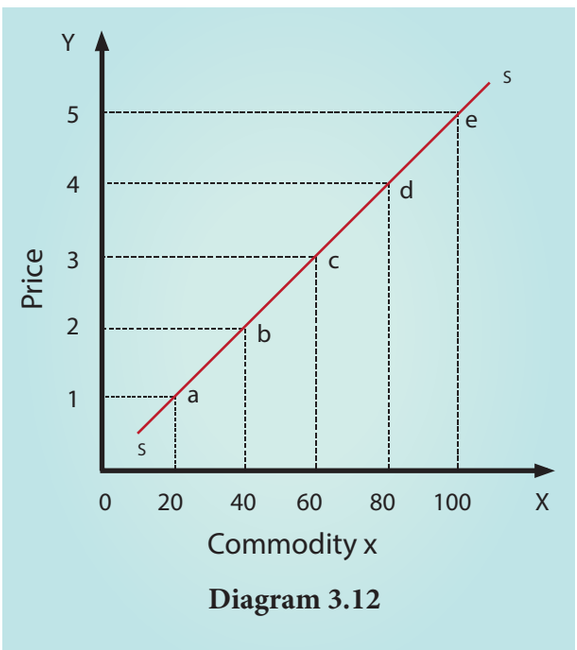


Diagram 3.12

The quantum supplied of commodity x is represented on X axis. And the price of the commodity is represented on the Y axis. The points such as a, b, c, d and e on the supply curve SS', represent various quantities at different prices.

3.12.3 Factors determining supply

1. **Price of the commodity**

   Higher the price larger the supply. Price is the incentive for the producers and sellers to supply more.

2. **Price of other commodities**

   The supply of a commodity depends not only upon its price but also price of other commodities. For instance if the price of commercial crops like cotton rises, this may result in reduction in cultivation of food crops like paddy and so its supply.

3. **Price of factors**

   When the input prices go up, this results in rise in cost and so supply will be affected.

4. **Price expectations**

   The expectation over future prices determines present supply. If a rise in price is anticipated in future, sellers tend to retain their produce for future sale and so supply in present market is reduced.

5. **Technology**

   With advancement in technology, production level improves, average cost **declines and as a result supply level increases.**

6. **Natural factors**

   In agriculture, natural factors like monsoon, climate etc. play a vital

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role in determining production level.

7. Discovery of new raw materials

The discovery of new raw materials which are cheaper and of high quality tends to increase supply of the product.

8. Taxes and subsidies

Subsidies for inputs, credit, power etc. encourage the producers to produce more. Withdrawal of such incentives will hamper production. Taxes both direct and indirect kill the ability and willingness to produce more.

9. Objective of the firm

When the goal of the firm is sales maximisation or improving market share, the supply of the product is likely to be higher.

3.12.4 Elasticity of Supply

Elasticity of supply may be defined as *the degree of responsiveness of change in supply to change in price on the part of sellers.*

It is mathematically expressed as:

Elasticity of supply = proportionate change in supply / proportionate change in price

$e_{s=}(\Delta Q_s/Q_s) / (\Delta P/P)$; $e_s = \Delta Q_s / \Delta P \times P/Q_s$

Where Q_s represents the supply, P represents price, Δ denotes a change.

3.12.5 Types of Elasticity of Supply

There are five types of elasticity of supply.

1. Relatively elastic supply (see Diagram 3.13)

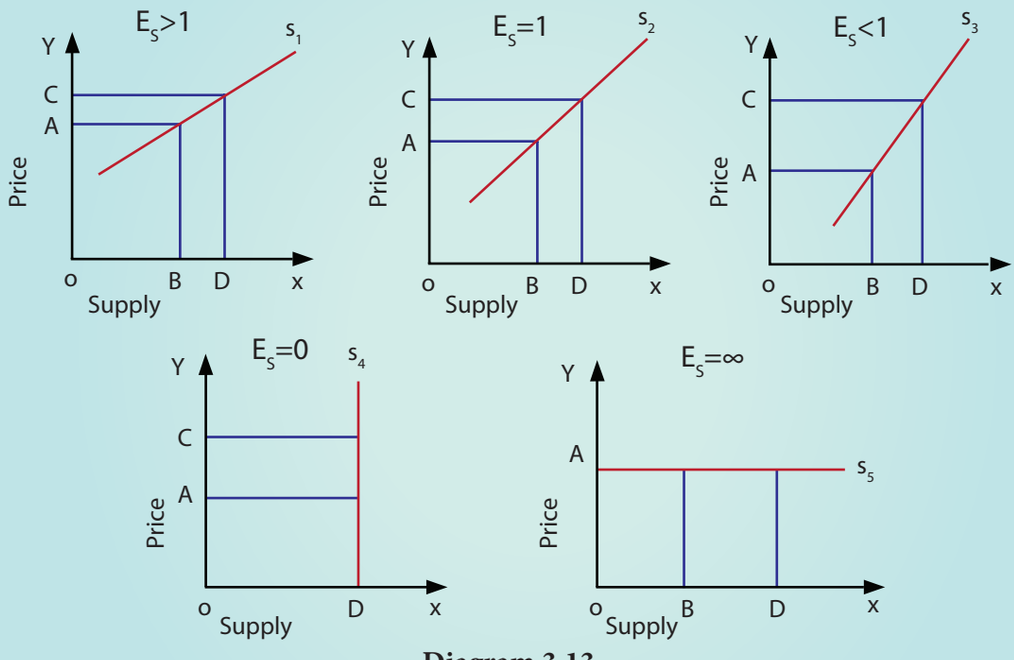


Diagram 3.13

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The co-efficient of elastic supply is greater than 1(E_s > 1). One percent change in the price of a commodity causes more than one per cent change in the quantity supplied of the commodity.

2. **Unitary elastic supply (see Diagram 3.13)**

The coefficient of elastic supply is equal to 1 (E_s = 1). One percent change in the price of a commodity causes an equal (one per cent) change in the quantity supplied of the commodity.

3. **Relatively inelastic supply (see Diagram 3.13)**

The coefficient of elasticity is less than one (E_s < 1). One percent change in the price of a commodity causes a less than one per cent change in the quantity supplied of the commodity.

4. **Perfectly inelastic supply (see Diagram 3.13)**

The coefficient of elasticity is equal to zero (E_s = 0). One percent change in the price of a commodity causes no change in the quantity supplied of the commodity.

5. **Perfectly elastic supply (see Diagram 3.13)**

The coefficient of elasticity of supply is infinity. (E_s = ∞). One percent change in the price of a commodity causes an infinite change in the quantity supplied of the commodity.

3.12.6 Factors governing elasticity of supply

1. **Nature of the commodity**

Durable goods can be stored for a long time. So, the producers can wait until they get a high price. Once they get higher price, larger supply is possible. The elasticity of supply of durable goods is high. But perishables are to be sold immediately. So perishables have low elasticity of supply.

2. **Cost of production**

When production is subject to either constant or increasing returns, additional production and therefore increased supply is possible. So elasticity of supply is greater. Under diminishing returns, increase in output leads to high cost. So elasticity of supply is less.

3. **Technical condition**

In large scale production with huge capital investment, supply cannot be adjusted easily. So elasticity of supply is lesser. Where capital equipment is less and technology simple, the supply is more elastic.

4. **Time factor**

During very short period when supply cannot be adjusted, elasticity of demand is very low. In short period, variable factors can be added and so supply can be adjusted to some extent. So elasticity of supply is more. In long period, even the fixed factors can be added and hence supply is highly elastic.

3.13 Conclusion

Production takes place with the view to fulfilling the demands of the consumers. Today consumption expands in a variety of ways. Hence, production has to necessarily expand

in size and improve in quality. Production should also help in the determination of the price of the factors so that the amount of the income generated be appropriately spent on the factors of production.

Glossary

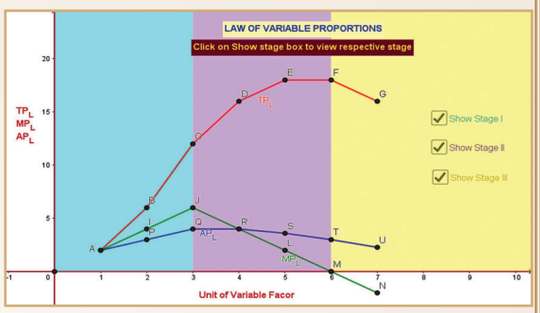
- **Production:** An activity that transforms input into output.
- **Factors of Production:** Four factors are Land, Labour, Capital and Organisation. Factor services are used in the process of production.
- **Land:** All gifts of Nature.
- **Labour:** Physical or mental effort of human being in the process of production.
- **Capital:** Man-made material source of production.
- **Organisation:** which takes decisions and bears risks.
- **Production function:** Technological relationship between inputs and output.
- **Supply:** The quantity of output which producers are willing and able to offer to the market at various prices.
- **Elasticity of Supply:** Responsiveness of the quantity supplied of a good to a change in its price.
- **Iso-quant:** All the combination of two inputs which are capable of producing same level of output.
- **Iso-cost:** All combination of two inputs shows that a firm can purchase with the same amount of money.
- **Short-run Production Function:** Relationship between inputs and output, when there is at least one fixed factor in the production process.
- **Long-run Production Function:** Relationship between inputs and output when all factors are variable.
- **Economies of Scale:** A proportionate saving in costs gained by an increased level of production.

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ICT CORNER

LAW OF VARIABLE PROPORTION

Analyse the changes in TPL and APL with respect to the changes in MPL.

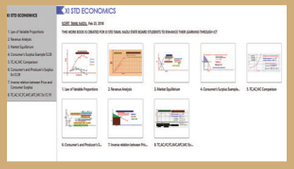


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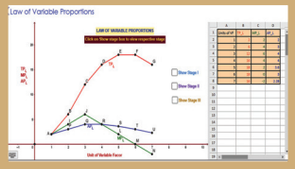
- Open the Browser type the URL given (or) Scan the QR Code.
- GeoGebra Work book called "XI STD ECONOMICS" will appear. Open the worksheet named "Law of Variable Proportions"
- In the Right side of the work sheet Total Product, Marginal Product and Average Product are given and in the left side Respective graph is shown. Analyse the data and the graphs drawn and the points.
- vAnalyse the change in MPL and click the check boxes, STAGE-I,STAGE-II and STAGE-III so that Each stage appears in different colours. Now analyse TPL and APL in each stage and compare what is given in the text book lesson.



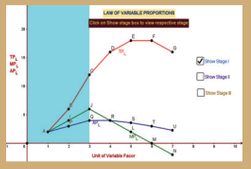
Step1



Step2



Step3



Step4

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MODEL QUESTIONS

Part-A Multiple Choice Questions

1. The primary factors of production are:
   - a. Labour and Organisation
   - b. Labour and Capital
   - c. Land and Capital
   - d. Land and Labour.

2. The man-made physical goods used to produce other goods and services are referred to as.
   - a. Land
   - b. Labour
   - c. Capital
   - d. Organization.

3. Formula for calculating AP is
   - a. ΔTP/N
   - b. ΔTP/ΔN
   - c. TP/MP
   - d. TP/N

4. Which factor is called the changing agent of the Society
   - a. Labourer
   - b. Land
   - c. Organizer
   - d. Capital

5. Who said, that one of the key of an entrepreneur is "uncertainty-bearing".
   - a. J.B.Clark
   - b. Schumpeter
   - c. Knight
   - d. Adam Smith

6. The functional relationship between "inputs" and "outputs" is called as
   - a. Consumption Function
   - b. Production Function
   - c. Savings Function
   - d. Investment Function

7. In a firm 5 units of factors produce 24units of the product. When the number of factor increases by one, the production increases to 30 units. Calculate the Avarage Product.
   - a. 30
   - b. 6
   - c. 5
   - d. 24

8. The short-run production is studied through
   - a. The Laws of Returns to Scale
   - b. The Law of Variable Proportions
   - c. Iso-quants
   - d. Law of Demand

9. The long-run production function is explained by
   - a. Law of Demand
   - b. Law of Supply
   - c. Returns to Scale
   - d. Law of Variable Proportions

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10. An Iso-quant curve is also known as
    a. Inelastic Supply Curve
    b. Inelastic Demand Curve
    c. Equi-marginal Utility
    d. Equal Product Curve

11. Mention the economies reaped from inside the firm
    a. financial
    b. technical
    c. managerial
    d. all of the above

12. Cobb-Douglas production function assumes
    a. Increasing returns to scale
    b. Diminishing returns to scale
    c. Constant returns to scale
    d. All of the above

13. Name the returns to scale when the output increases by more than 5%, for a 5% increase in the inputs,
    a. Increasing returns to scale
    b. decreasing returns to scale
    c. Constant returns to scale
    d. All of the above

14. Which of the following is not a characteristic of land?
    a. Its limited supply.
    b. It is mobile
    c. Heterogeneous
    d. Gift of Nature

15. Product obtained from additional factors of production is termed as
    a. Marginal product
    b. Total product
    c. Average product
    d. Annual product

16. Modern economists have propounded the law of
    a. Increasing returns
    b. decreasing returns
    c. Constant returns
    d. variable proportions.

17. Producer's equilibrium is achieved at the point where:
    a. Marginal rate of technical substitution(MRTS) is greater than the price ratio
    b. MRTS is lesser than the price ratio
    c. MRTS and price ratio are equal to each other
    d. The slopes of isoquant and isocost lines are different.

18. The relationship between the price of a commodity and the supply of commodity is
    a. Negative
    b. Positive
    c. Zero
    d. Increase

19. If average product is decreasing, then marginal product
    a. must be greater than average product
    b. must be less than average product
    c. must be increasing
    d. both a and c

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20. A production function measures the relation between

a. input prices and output prices

b. input prices and the quantity of output

c. the quantity of inputs and the quantity of output.

d. the quantity of inputs and input prices.

Part-A Answers

1	2	3	4	5	6	7	8	9	10
d	C	d	c	c	b	c	b	c	d
11	12	13	14	15	16	17	18	19	20
d	C	a	b	a	a	c	b	b	c

Part-B Answer the following questions in one or two sentences.

21. Classify the factors of production.

22. Define Labour.

23. State the production function.

24. Define Marginal Product of a factor.

25. What is Iso-cost line?

26. What are the conditions for producer's equilibrium?

27. What are the reasons for upward sloping supply curve?

Part-C Answer the following questions in one paragraph.

28. What are the characteristics of land?

29. What are the factors governing elasticity of supply?

30. What are the functions of Entrepreneur?

31. State and explain the elasticity of supply.

32. Bring out the Relationship among Total, Average and Marginal Products.

33. Illustrate the concept of Producer's Equilibrium.

34. State the Cobb-Douglas Production Function.

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Part-D Answer the following questions in about a page

35. Examine the Law of Variable Proportions with the help of a diagram.

36. List out the properties of iso-quants with the help of diagrams.

37. Elucidate the Laws of Returns to Scale. Illustrate.

38. Explain the internal and external economies of scale.

ACTIVITY

1. Visit a market of your locality and write a report on the factors that influence the quantity of supply of a commodity.
2. Visit a factory in your locality and show how the four factors of production are effectively employed to produce the product.

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CHAPTER

4 Cost and Revenue Analysis





"The big hurdle is going out and raising the revenue "

–Tyler Cowen

Learning Objectives

1. To identify the cost involved in the production of any commodity or service and to present the ways in which it is utilized, combining with revenue in the calculation of profit of the firm; and
2. To point out how revenue is realized at the sale of the goods and services produced in various types of market.

4.1 Introduction

Cost and revenue analysis refers to examining the cost of production and sales revenue of a production unit or firm under various conditions. The objective of a firm is to earn profit, and not to make loss. However, a firm's profit or loss is primarily determined by its costs and revenue. In simple terms, profit or loss is defined as the difference between the total revenue and the total cost i.e., Profit (or) Loss = Total Revenue - Total Cost. As costs and revenue are very important to decide the production behaviour of a firm and its supply behaviour in the market, it is necessary to understand the cost and revenue concepts .

4.2 Cost Analysis

Cost refers to the total expenses incurred in the production of a commodity. Cost analysis refers to the study of behaviour of cost in relation to one or more production criteria, namely size of output, scale of production, prices of factors and other economic variables. The functional relationship between cost and output is expressed as 'Cost Function'.

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A **Cost Function** may be written as

$$C = f(Q)$$

where, C= Cost

Q=Quantity of output

Cost functions are derived functions because they are derived from Production Functions.

We shall discuss the basic cost concepts and their behaviour below.

4.3 Cost Concepts

4.3.1 Money Cost

Production cost expressed in money terms is called as money cost. In other words, it is the total money expenses incurred by a firm in producing a commodity. Money cost includes the expenditures such as cost of raw materials, payment of wages and salaries, payment of rent, interest on capital, expenses on fuel and power, expenses on transportation and other types of production related costs. These costs are considered as out of pocket expenses. Money costs are also called Prime Cost or Direct Cost or Nominal Cost or Accounting Cost or Explicit Cost or Out of Pocket Cost, suiting to context.

4.3.2 Real Cost

Real cost refers to the payment made to compensate the efforts and sacrifices of all factor owners for their services in production. It includes the efforts and sacrifices of landlords in the use of land, capitalists to save and invest, and workers in foregoing leisure. Alfred Marshall regarded pains and sacrifices of labour as real cost of production.

4.3.3 Explicit Cost
(Paid out cost)


Adam Smith

Payment made to others for the purchase of factors of production is known as Explicit costs. It refers to the actual expenditure of the firm to purchase or hire the inputs the firm needs. Explicit cost includes, i) wages, ii) payment for raw material, iii) rent for the building, iv) interest for capital invested, v) expenditure on transport and advertisement vi) other expenses like license fee, depreciation and insurance charges, etc. It is also called Accounting Cost or Out of Pocket Cost or Money Cost.

4.3.4 Implicit Cost

Payment made to the use of resources that the firm already owns, is known as Implicit Cost. In simple terms, Implicit Cost refers to the imputed cost of a firm's self-owned and self-employed resources. A firm or producer may use his own land, building, machinery, car and other factors in the process of production. These costs are not recorded under normal accounting practices as no cash payment takes place. However, the value of the own services are imputed and considered for preparing the profit and loss accounts. Implicit Cost is also called Imputed Cost or Book Cost.

4.3.5 Economic Cost

It refers to all payments made to the resources owned and purchased or hired by the firm in order to ensure their regular supply to the

process of production. It is the summation of explicit and implicit costs. Economic Cost is relevant to calculate the normal profit and thereby the economic profit of a firm.

Economic Cost = Implicit Cost + Explicit Cost

4.3.6 Social Cost

It refers to the total cost borne by the society due to the production of a commodity. Alfred Marshall defined the term social cost to represent the efforts and sacrifices undergone by the various members of the society in producing a commodity. Social Cost is the cost that is not borne by the firm, but incurred by others in the society. For example, large business firms cause air pollution, water pollution and other damages in a particular area which involve cost to the society. These costs are treated as social cost. It is also called External Cost.

4.3.7 Opportunity Cost

It refers to the cost of next best alternative use. In other words, it is the value of the next best alternative foregone. For example, a farmer can cultivate both paddy and sugarcane in a farm land. If he cultivates paddy, the opportunity cost of paddy output is the amount of sugarcane output given up. Opportunity Cost is also called as 'Alternative Cost' or 'Transfer Cost'.

4.3.8 Sunk Cost

A cost incurred in the past and cannot be recovered in future is called as Sunk Cost. This is historical but irrelevant for future business decisions. It is called sunk because, they are unalterable, unrecoverable, and if once invested it should be treated as drowned or disappeared. For example, if a firm purchases a specialized equipment designed for a special plant, the expenditure on this equipment is a sunk cost, because it has no alternative use and its opportunity Cost is zero. Sunk cost is also called as 'Retrospective Cost'.

4.3.9 Floating Cost

It refers to all expenses that are directly associated with business activities but not with asset creation. It does not include the purchase of raw material as it is part of current assets. It includes payments like wages to workers, transportation charges, fee for power and administration. Floating cost is necessary to run the day-to-day business of a firm.

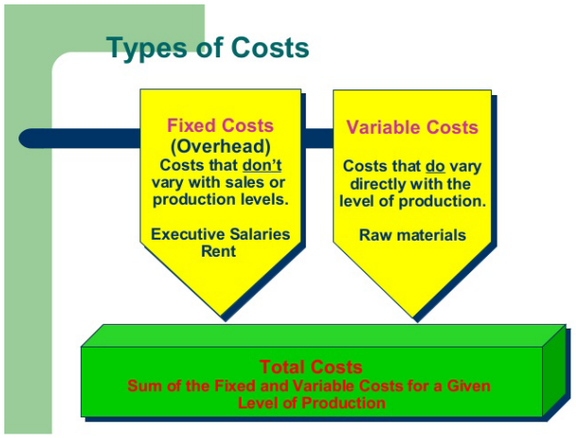
4.3.10 Prime Cost

All costs that vary with output, together with the cost of administration are known as Prime Cost. In short, Prime cost = Variable costs + Costs of Administration.

4.3.11 Fixed Cost

Fixed Cost does not change with the change in the quantity of output. In other words, expenses on fixed factors remain unchanged irrespective of the level of output, whether the output is increased or decreased or even it becomes zero. For example, rent of the factory, watchman's wages, permanent worker's salary, payments for minimum equipments and machines insurance premium, deposit for power, license fee, etc fixed cost is also called as 'Supplementary Cost' or 'Overhead Cost'.

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4.3.12 Variable Cost

These costs vary with the level of output. Examples of variable costs are: wages of temporary workers, cost of raw materials, fuel cost, electricity charges, etc. Variable cost is also called as Prime Cost, Special Cost, or Direct Cost.

4.4 Short run Cost Curves

4.4.1 Total Fixed Cost (TFC)

Table 4.1 Total Fixed Cost

Output (in unit)	Total Fixed Cost (in ₹)
0	1000
1	1000
2	1000
3	1000
4	1000
5	1000

All payments for the fixed factors of production are known as Total Fixed Cost. A hypothetical TFC is shown in table 4.1 and diagram 4.1

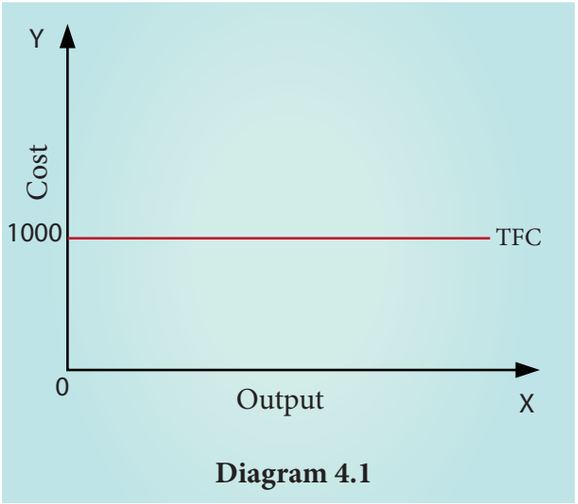


Diagram 4.1

For instance if TC = $Q^3 - 18Q^2 + 91Q + 12$, the fixed cost here is 12. That means, if Q is zero, the Total cost will be 12, hence fixed cost.

It could be observed that TFC does not change with output. Even when the output is zero, the fixed cost is ₹.1000. TFC is a horizontal straight line, parallel to X axis.

4.4.2 Total Variable Cost (TVC)

All payments to the variable factors of production are called Total Variable Cost. Hypothetical TVC is shown in table-4.2 and Diagram 4.2

Table 4.2 Total Variable Cost

Output (in unit)	Total Variable Cost (in ₹)
0	0
1	200
2	300
3	400
4	600
5	900

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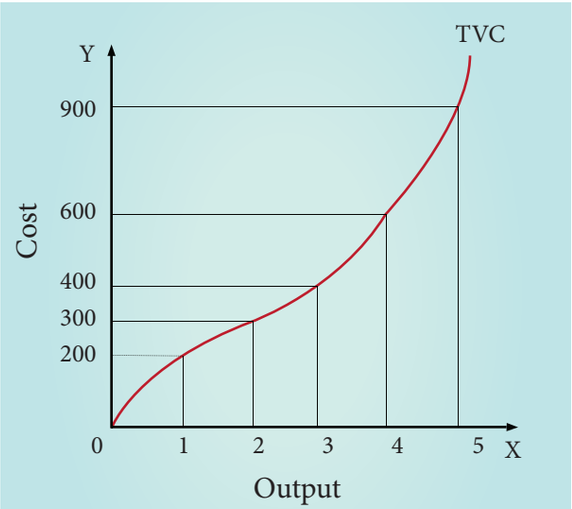


Diagram 4.2

In the diagram the TVC is zero when nothing is produced. As output increases TVC also increases. TVC curve slopes upward from left to right. For instance in TC = Q^3 – $18Q^2$ + 91Q +12, variable cost, TVC = Q^3 – $18Q^2$ + 91Q

4.4.3 Total Cost Curves

Total Cost means the sum total of all payments made in the production. It is also called Total Cost of Production. Total cost is the summation of Total Fixed Cost (TFC) and Total Variable Cost (TVC). It is written symbolically as

TC = TFC + TVC. For example, when the total fixed cost is ₹ 1000 and the total variable cost is ₹ 200 then the Total cost is = ₹ 1200 (₹ 1000 + ₹ 200).

If TFC = 12 and

TVC = Q^3 – $18Q^2$ + 91Q

TC = 12 + Q^3 – $18Q^2$ + 91Q

Table 4.3 Total Cost Curves

Output (in unit)	Total Fixed Cost (TFC) (in ₹)	Total Variable Cost (TVC) (in ₹)	Total Cost (TC) TFC+TVC (in ₹)
0	1000	0	1000
1	1000	200	1200
2	1000	300	1300
3	1000	400	1400
4	1000	600	1600
5	1000	900	1900

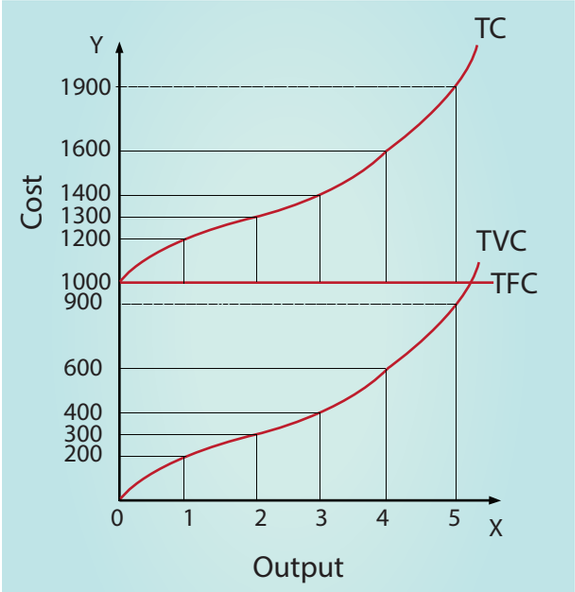


Diagram 4.3

It is to be noted that

a) The TC curve is obtained by adding TFC and TVC curves vertically.

b) TFC curve remains parallel to x axis, indicating a straight line.

c) TVC starts from the origin and moves upwards, as no variable cost is incurred at zero output.

d) When TFC and TVC are added, TC starts from TFC and moves upwards.

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e) TC curve lies above the TFC curve

f) TVC and TC curves are the same shapes but beginning point is different.

4.4.4 Average Fixed Cost (AFC)

It refers to the fixed cost per unit of output. It is obtained by dividing the total fixed cost by the quantity of output. AFC = TFC / Q where, AFC denotes average fixed cost, TFC denotes total fixed cost and Q denotes quantity of output. For example, if TFC is 1000 and the quantity of output is 10, the AFC is ₹ 100, obtained by dividing ₹ 1000 by 10. AFC is shown in table 4.4 and diagram 4.4.

Table 4.4 Average Fixed Cost

Q (in unit)	TFC (in ₹)	AFC TFC/Q (in ₹)
0	1000	1000/0 = ∞
1	1000	1000/1 = 1000
2	1000	1000/2 = 500
3	1000	1000/3 = 333
4	1000	1000/4 = 250
5	1000	1000/5 = 200

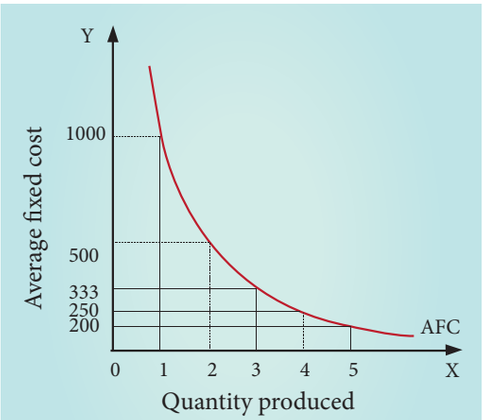


Diagram 4.4

It is to be noted that

a. AFC declines as output increases, as fixed cost remains constant

b. AFC curve is a downward sloping throughout its length, never touching X and Y axis. It is asymptotic to both the axes.

c. The shape of the AFC curve is a rectangular hyperbola.

4.4.5 Average Variable Cost (AVC)

Table 4.5 Average Variable Cost

Q (in unit)	TVC (in ₹)	AVC TVC/Q (in ₹)
0	0	0/0 = 0
1	200	200/1 = 200
2	300	300/2 = 150
3	400	400/3 = 133
4	600	600/4 = 150
5	900	900/5 = 180

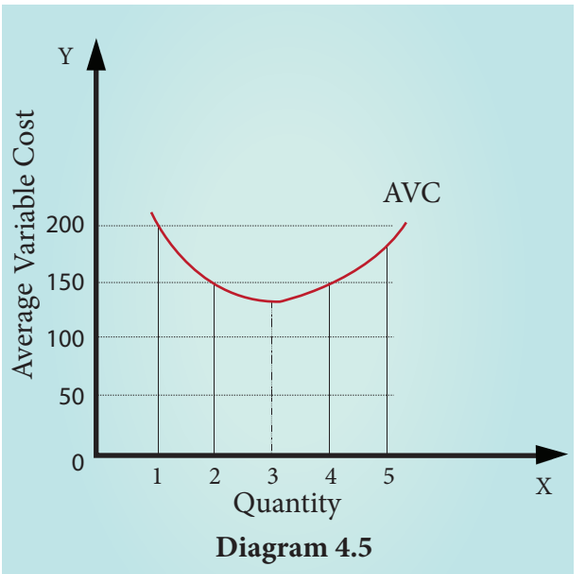


Diagram 4.5

It refers to the total variable cost per unit of output. It is obtained by dividing total variable cost (TVC) by the quantity of

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output (Q). ***AVC = TVC / Q*** where, AVC denotes Average Variable cost, TVC denotes total variable cost and Q denotes quantity of output. For example, When the TVC is ₹ 300 and the quantity produced is 2, the AVC is ₹ 150, (AVC = 300/2 = 150) AVC is shown in table 4.5 and Diagram 4.5. If TVC = $Q^3 - 18Q^2 + 91Q$

AVC = $Q^2 - 18Q + 91$

It is to be noted that

a) AVC declines initially and then increases with the increase of output.

b) AVC declines up to a point and moves upwards steeply, due to the law of returns.

c) AVC curve is a U-shaped curve.

4.4.6 Average Total Cost (ATC) or Average Cost (AC)

It refers to the total cost per unit of output. It can be obtained in two ways.

1. By dividing the firm's total cost (TC) by the quantity of output (Q). ***ATC = TC / Q***. For example, if TC is ₹ 1600 and quantity of output is Q=4, the Average Total Cost is ₹ 400. (ATC = 1600/4 = 400) If ATC is $Q^3 - 18Q^2 + 91Q + 12$, then AC = $Q^2 - 18Q + 91 + {}^{12}/_{Q}$

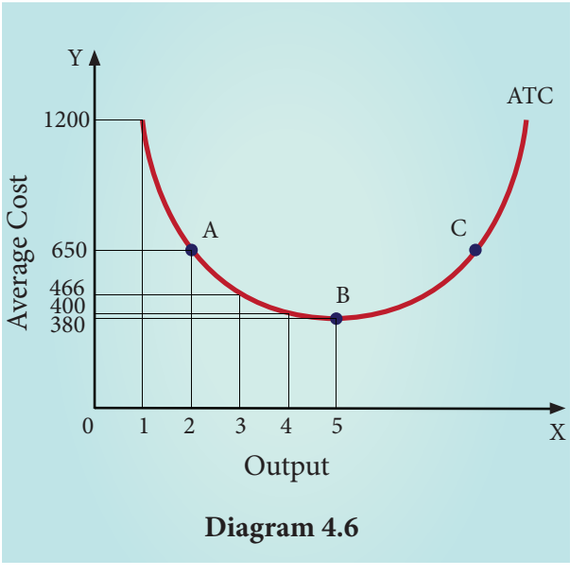


Diagram 4.6

2. ByATC is derived by adding together Average Fixed Cost (AFC) and Average Variable Cost (AVC) at each level of output. ***ATC = AFC + AVC***. For example, when Q= 2, TFC = 1000, TVC=300; AFC=500; AVC=150;ATC=650. ATC or AC is shown in table 4.6 and Diagram 4.6

It should be noted that

Table 4.6 Average Total Cost or Average Cost

Q (in unit)	TFC (in ₹)	TVC (in ₹)	TC (in ₹) TFC +TVC	ATC (TC/Q) (in ₹)	AFC (in ₹)	AVC (in ₹)	ATC (AFC +AVC) (in ₹)
0	1000	0	1000	1000 /0= ∞	0	0	0 + 0 = 0
1	1000	200	1200	1200 /1= 1200	1000	200	1000+200 =1200
2	1000	300	1300	1300 /2= 650	500	150	500 + 150= 650
3	1000	400	1400	1400 /3= 466	333	133	333 + 133= 466
4	1000	600	1600	1600 /4= 400	250	150	250 + 150= 400
5	1000	900	1900	1900 /5= 380	200	180	200 + 180= 380

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a) ATC curve is also a 'U' shaped curve.

b) Initially the ATC declines, reaches a minimum when the plant is operated optimally, and rises beyond the optimum output.

c) The 'U' shape of the AC reflects the law of the variable proportions.

4.4.7 Marginal Cost (MC)

Table 4.7 Marginal Cost

Q (in unit)	TC (in ₹)	MC (in ₹)
0	1000	--
1	1200	1200 - 1000 = 200
2	1300	1300 - 1200 = 100
3	1400	1400 - 1300 = 100
4	1600	1600 - 1400 = 200
5	1900	1900- 1600 = 300

It is the cost of the last single unit produced. It is defined as the change in total costs resulting from producing one extra unit of output. In other words, it is the addition made to the total cost by producing one extra unit of output. Marginal cost is important for deciding whether any additional output can be produced or not. MC = ΔTC / ΔQ where MC denotes Marginal Cost, ΔTC denotes change in total cost and ΔQ denotes change in total quantity. For example, a firm produces 4 units of output and the Total cost is ₹ 1600. When the firm produces one more unit (4 +1 = 5 units) of output at the total cost of ₹ 1900, the marginal cost is ₹ 300.

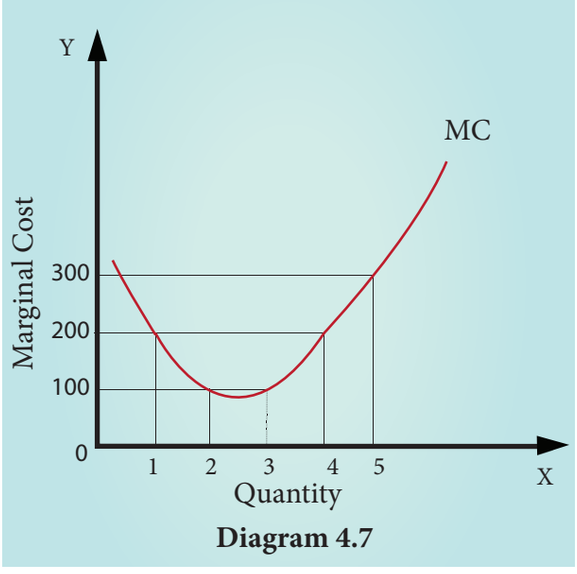


Diagram 4.7

MC = ₹ 1900 – ₹ 1600 = ₹ 300.

The other method of estimating MC is :

$$MC_n = TC_n - TC_{n-1}$$

where, 'MC' denotes Marginal Cost, 'TC_n' denotes Total cost of 'n'th item, TC_{n-1} denotes Total Cost of 'n-1' th item. For example,

when TC_5 = ₹ 1900, $TC_{(n-1)}$ = ₹1600,

$$MC = TC_5 - TC_{5-1}$$

$$1900 - 1600 = 300$$

MC schedule is shown in Table 4.7 and MC Curve is shown in diagram 4.7.

It is to be noted that

a) MC falls at first due to more efficient use of variable factors.

b) MC curve increases after the lowest point and it slopes upward.

c) MC curve is a U-shaped curve.

d) The slope of TC is MC.

If TC = $Q^3 - 18Q^2 + 91Q + 12$

MC = $3Q^2 - 36Q + 91$

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4.4.8 The relationship between Average Cost and Marginal cost

There is a unique relationship between the AC and MC curves as shown in

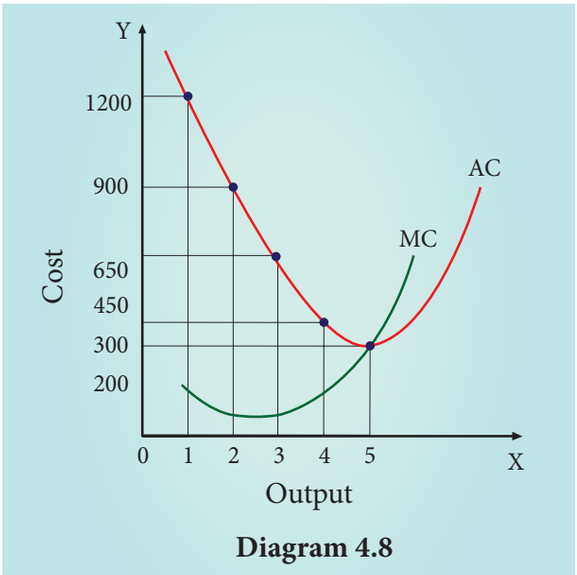


Diagram 4.8

diagram 4.8.

1. When AC is falling, MC lies below AC.
2. When AC becomes constant, MC also becomes equal to it.
3. When AC starts increasing, MC lies above the AC.
4. MC curve always cuts AC from below at AC's its minimum point.

4.5 Long Run Cost Curve:

In the long run all factors of production become variable. The existing size of the firm can be increased in the case of long run. There are neither fixed inputs nor fixed costs in the long run.

LAC is given in diagram 4.9.

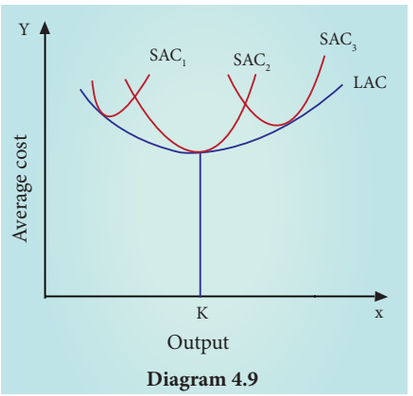


Diagram 4.9

Long run average cost (LAC) is equal to long run total costs divided by the level of output.

$$LAC = LTC/Q$$

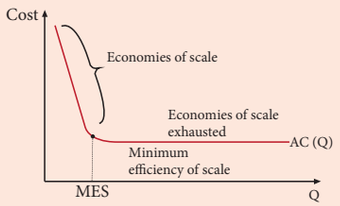
where, LAC denotes Long-Run Average Cost,

LTC denotes Long-run Total Cost and

Q denotes the quantity of output.

The LAC curve is derived from short-run average cost curves. It is the locus of points denoting the least cost curve of producing the corresponding output. The LAC curve is called 'Plant Curve' or 'Boat shape Curve' or 'Planning Curve' or 'Envelop Curve'.

A significant recent development in cost theory is that the long-run average cost curve is L- shaped rather than U-shaped. The L-shape of the long-run average cost curve implies that in the beginning when output is expanded through increase in plant size and associated variable factors, cost per unit falls rapidly due to economies of scale.



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4.6 Revenue Analysis

The amount of money that a producer receives in exchange for the sale of goods is known as revenue. In short, revenue means sales revenue. It is the amount received by a firm from the sale of a given quantity of a commodity at the prevailing price in the market. For example, if a firm sells 10 books at the price of ₹100 each, the total revenue will be ₹1000.

4.6.1 Revenue Concepts

The three basic revenue concepts are: Total Revenue, Average Revenue and Marginal Revenue.

a) Total Revenue:

Total revenue is the amount of income received by the firm from the sale of its products. It is obtained by multiplying the price of the commodity by the number of units sold.

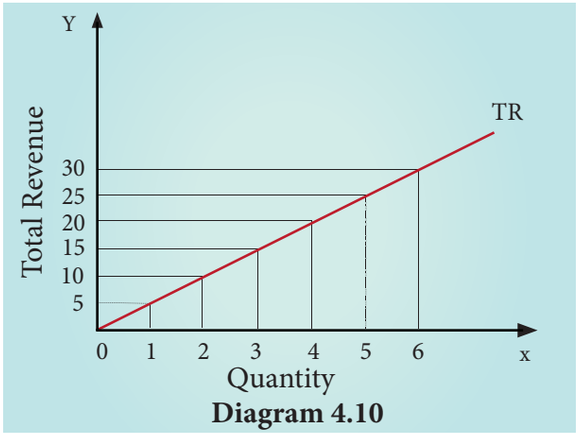


Diagram 4.10

Table 4.8
Total Revenue - Constant Price

Quantity sold (Q)	Price (P)	Total Revenue (TR)
1	5	5
2	5	10
3	5	15
4	5	20
5	5	25
6	5	30

$$TR = P \times Q$$

where,

TR denotes Total Revenue,

P denotes Price and

Q denotes Quantity sold.

For example, a cell-phone company sold 100 cell-phones at the price of ₹ 500 each. TR is ₹ 50,000. (TR= 500 × 100 = 50,000).

When price is constant, the behaviour of TR is shown in table 4.8 and diagram 4.10, assuming P=5. When P = 5; TR = PQ

When price is declining with increase in quantity sold. (Eg. Imperfect Competition on the goods market) the behaviour of TR is shown in table 4.9 and diagram 4.11. TR can be obtained from Demand fuction: If Q = 11–P,

When P = 1, Q = 10

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Table 4.9
Total Revenue - Price declining

Quantity sold (Q)	Price (P)	Total Revenue (TR)
1	10	10
2	9	18
3	8	24
4	7	28
5	6	30
6	5	30
7	4	28
8	3	24
9	2	18
10	1	10

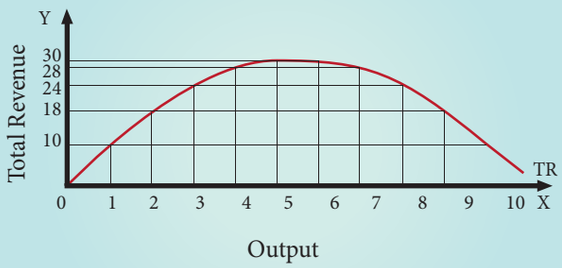


Diagram 4.11

TR = PQ = 1 × 10 = 10

When P = 3, Q = 8, TR = 24

When P = 10, Q = 1, TR = 10

b) Average Revenue

Average revenue is the revenue per unit of the commodity sold. It is calculated by dividing the Total Revenue(TR) by the number of units sold (Q)

AR = TR /Q; if TR = PQ, AR = PQ/Q = P

AR denotes Average Revenue, TR denotes Total Revenue and Q denotes Quantity of unit sold.

For example, if the Total Revenue from the sale of 5 units is ₹30, the Average Revenue is ₹6. **(AR= 30/5 =6)** It is to be noted that AR is equal to Price.

$$AR=TR/Q = PQ/Q=P$$

c) Marginal Revenue

Marginal revenue (MR) is the addition to the total revenue by the sale of an additional unit of a commodity. MR can be found out by dividing change in total revenue by the change in quantity sold out. MR = ΔTR / ΔQ where MR denotes Marginal Revenue, ΔTR denotes change in Total Revenue and ΔQ denotes change in total quantity.

The other method of estimating MR is:

$$MR=TR_n - TR_{n-1} \text{ (or) } TR_{n+1} - TR_n$$

where, MR denotes Marginal Revenue, TR_n denotes total revenue of n^{th} item, TR_{n-1} denotes Total Revenue of $n\text{-}1^{th}$ item and TR_{n+1} denotes Total Revenue of $n+1^{th}$item.

If TR = PQ MR = ΔTR/ΔQ = P,

which is equal to AR.

4.6.2 Relationship between AR and MR Curves

If a firm is able to sell additional units at the same price then AR and MR will be constant and equal. If the firm is able to sell additional units only by reducing the price, then both AR and MR will fall and be different .

Constant AR and MR (at Fixed Price)

When price remains constant or fixed, the MR will be also constant and will coincide with AR. Under perfect competition as the price is uniform and fixed, AR is equal to MR and their shape will be a straight

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line horizontal to X axis. The AR and MR Schedule under constant price is given in Table 4.10 and in the diagram 4.12

Table 4.10
TR, AR, MR - Constant price

Quantity Sold (Q)	Price (P) ₹	Total Revenue (TR) ₹	Average Revenue (AR) ₹	Marginal Revenue (MR) ₹
1	5	5	5	5
2	5	10	5	5
3	5	15	5	5
4	5	20	5	5
5	5	25	5	5
6	5	30	5	5

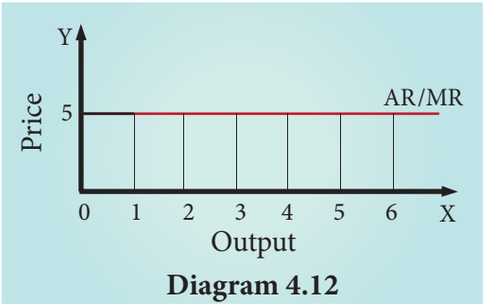


Diagram 4.12

Declining AR and MR (at Declining Price)

Under imperfect competition, when a firm sells large quantities at lower prices both AR and MR will fall but the fall in MR will be more steeper than the fall in the AR.

It is to be noted that MR will be lower than AR. Both AR and MR will be sloping downwards straight from left to right. The MR curve divides the distance between AR Curve and Y axis into two equal parts. The decline in AR need not be a straight line or linear. If the prices are declining with the increase in quantity sold, the AR can be non-linear, taking a concave or convex shape to the origin

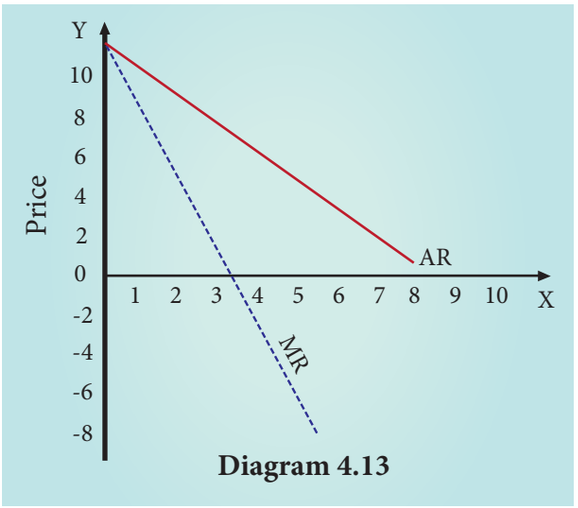


Diagram 4.13

Table 4.11
AR, TR, MR at declining price

Quantity Sold (Q)	Price (P)/ Average Revenue (AR) ₹	Total Revenue (TR) ₹	Marginal Revenue (MR) ₹
1	10	10	-
2	9	18	8
3	8	24	6
4	7	28	4
5	6	30	2
6	5	30	0
7	4	28	-2
8	3	24	-4
9	2	18	-6
10	1	10	-8

4.6.3 Relationship among TR, AR and MR Curves:

When marginal revenue is positive, total revenue rises, when MR is zero the total revenue becomes maximum. When marginal revenue becomes negative total revenue starts falling. When AR and MR both are falling, then MR falls at a faster rate than AR.

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4.6.4 TR, AR, MR and Elasticity of Demand

The relationship among AR, MR and elasticity of demand (e) is stated as follows.

e = AR/AR – MR

The relationship between the AR curve and MR curve depends upon the elasticity of AR curve (AR = DD = Price).

a. When price elasticity of demand is greater than one, MR is positive and TR is increasing.

b. When price elasticity of demand is less than one, MR is negative and TR is decreasing.

c. When price elasticity of demand is equal to one, MR is equal to zero and TR is maximum and constant.

It is to be noted that in the output range of 1 to 5 units, the price elasticity of demand is greater than one according to total outlay method. Hence, TR is increasing and MR is positive.

Table 4.12 TR, AR, MR & Elasticity

Quantity (Q)	Price (P)	TR	AR	MR	Elasticity
1	10	10	10	10	
2	9	18	9	8	
3	8	24	8	6	e > 1
4	7	28	7	4	
5	6	30	6	2	
6	**5**	**30**	**5**	**0**	**e = 1**
7	4	28	4	-2	
8	3	24	3	-4	
9	2	18	2	-6	e < 1
10	1	10	1	-8	
11	0	0	0	-10	

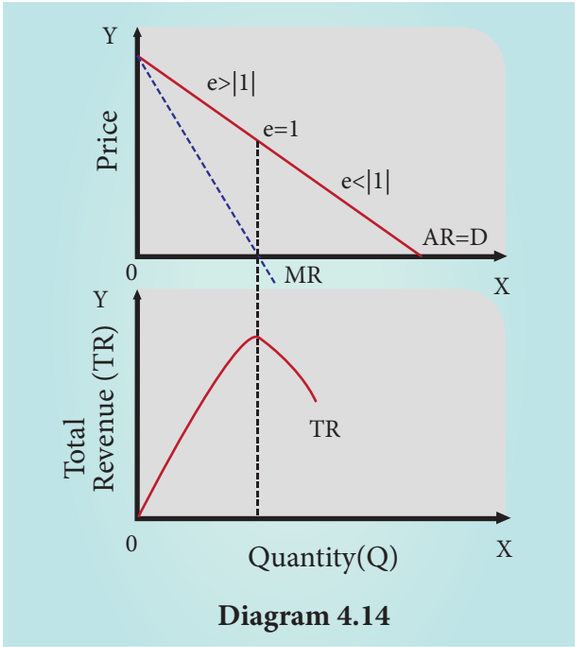


Diagram 4.14

At the output range of 5 to 6 units, the price elasticity of demand is equal to one. Hence, TR is maximum and MR equals to zero.

At the output range of 6 units to 10 units, the price elasticity of demand is less than unity. Hence, TR is decreasing and MR is negative.

4.7 Conclusion

This Chapter has analysed the behaviour of Cost Curves and revenue curves under two situations and the relationship among price elasticity of demand , TR, AR and MR.

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GLOSSARY

Cost	It refers to expenses incurred on production
Revenue	It refers to sales revenue
Explicit Cost	It refers to out of pocket expenses or money cost or accounting costs. They are the payments made to others.
Implicit Cost	The cost imputed for the resources provided by the owner.
Fixed Costs	The costs that remain constant at all levels of output. They do not vary with output.
Variable Cost	The cost that varies with the level of output.
Total Cost	The sum of total fixed cost and total variable costs.
Marginal Cost	The additional cost incurred for producing one more unit of output.
Average Cost	Cost per unit of output produced. It is obtained by dividing total cost by output.
Average Variable Cost	Variable Cost per unit of output is obtained by dividing total variable cost by output.
Average Fixed Cost	Fixed cost per unit of output is obtained by dividing total fixed cost by output.
Average Revenue	Average revenue refers to revenue per unit of output sold. It is obtained by dividing the total revenue by quantity sold.
Marginal Revenue	The additional revenue obtained by selling one more unit of output.

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ICT CORNER

Cost and Revenue Analysis ANALYSIS: REVENUE ANALYSIS

This activity for Revenue Analysis helps in analysis of Total Revenue Under different conditions.



Steps:

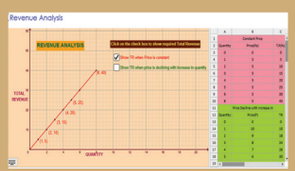
- Open the Browser type the URL given (or) Scan the QR Code.
- GeoGebra Work book called "XI STD ECONOMICS" will appear. Open the worksheet named "Revenue Analysis"
- In the Right side of the work sheet two data are given. 1.Total Revenue for the quantity when Price is constant and 2. Total Revenue for the quantity when Price is reduced when the quantity is increased. Analyse the graph drawn on the Left side for constant price. It is a straight-line graph.
- Now click on the check box , "Show Total Revenue when price is declining with increase in quantity". You can see a curve graph. Now analyse the data values and Graph in each Data and compare what is given in the text book lesson. You can get similar data from internet and type in the columns and see the change in graph.



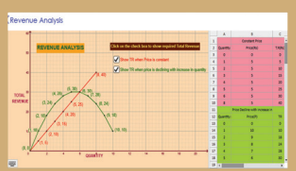
Step1



Step2



Step3



Step4

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MODEL QUESTIONS

Part-A Multiple Choice Questions

1. Cost refers to _____
   a. price
   b. value
   c. fixed cost
   d. production

2. Cost functions are also known as _____ function.
   a. production
   b. investment
   c. demand
   d. consumption

3. Money cost is also known as _____ cost.
   a. explicit
   b. implicit
   c. social
   d. real

4. Explicit cost plus implicit cost denote _____ cost.
   a. social
   b. economic
   c. money
   d. fixed

5. Explicit costs are termed as
   a. out of pocket expenses
   b. real cost
   c. social cost
   d. sunk cost

6. The costs of self–owned resources are termed as _____ cost.
   a. real
   b. explicit
   c. money
   d. implicit

7. The cost that remains constant at all levels of output is _____ cost.
   a. fixed
   b. variable
   c. real
   d. social

8. Identify the formula of estimating average variable cost.
   a. TC/Q
   b. TVC/Q
   c. TFC/Q
   d. TAC/Q

9. The cost incurred by producing one more unit of output is_____cost.
   a. variable
   b. fixed
   c. marginal
   d. total

10. The cost that varies with the level of output is termed as _____ cost.
    a. money
    b. variable cost
    c. total cost
    d. fixed cost

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11. Wage is an example for _____ cost of the production.

a. fixed

b. variable

c. marginal

d. opportunity

12. The cost per unit of output is denoted by _____ cost.

a. average

b. marginal

c. variable

d. total

13. Identify the formula of estimating average cost.

a. AVC/Q

b. TC/Q

c. TVC/Q

d. AFC/Q

14. Find total cost where TFC=I00 and TVC = 125.

a. 125

b. 175

c. 225

d. 325

15. Long-run average cost curve is also called as _____ curve.

a. demand

b. planning

c. production

d. sales

16. Revenue received from the sale of products is known as _____ revenue.

a. profit

b. total

c. average

d. marginal

17. Revenue received from the sale of additional unit is termed as _____ revenue.

a. profit

b. average

c. marginal

d. total

18. Marginal revenue is the addition made to the

a. total sales

b. total revenue

c. total production

d. total cost

19. When price remains constant, AR will be _____ MR.

a. equal to

b. greater than

c. less than

d. not related to

20. A book seller sold 40 books with the price of ₹10 each. The total revenue of the seller is ₹_____.

a. 100

b. 200

c. 300

d. 400

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Part- A Answers

1	2	3	4	5	6	7	8	9	10
d	a	a	b	a	d	a	b	c	b
11	12	13	14	15	16	17	18	19	20
b	a	b	c	b	b	c	b	a	d

Part-B Answer the following questions in one or two sentences.

21. Define cost.

22. Define cost function.

23. What do you mean by fixed cost?

24. Define Revenue.

25. Explicit Cost - Define.

26. Give the definition for 'Real Cost'.

27. What is meant by Sunk cost?

Part-C Answer the following questions in one paragraph.

28. Distinguish between fixed cost and variable cost.

29. State the differences between money cost and real cost.

30. Distinguish between explicit cost and implicit cost.

31. Define opportunity cost and provide an example.

32. State the relationship between AC and MC.

33. Write a short note on Marginal Revenue.

34. Discuss the Long run cost curves with suitable diagram.

Part-D Answer the following questions in about a page

35. If total cost = $10+Q^3$, find out AC, AVC, TFC, AFC when Q=5.

36. Discuss the short run cost curves with suitable diagram.

37. Bring out the relationship between AR and MR curves under various price conditions.

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ACTIVITY

Visit a small business firm and identify the various items of expenditure incurred by the firm. Classify the items under fixed cost and variable cost. Estimate Total Fixed Cost, Total Variable Cost, Total Cost and Average Fixed Cost, Average Variable Cost and Average Total Cost.

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CHAPTER

5 MARKET STRUCTURE AND PRICING

M3G5C

"Marketing is not the art of finding clever ways to dispose of what you make. It is the art of creating genuine customer value".

– Philip Kotler

Learning Objectives

1. To understand the characteristics of markets and how the price and output are determined under the several types of markets; and,
2. To study the nature of the profit obtained by a firm under different types of markets

5.1 Introduction

Every commodity or service that is exchanged has two sides: the supply side and the demand side. The supply side contains information on the number of sellers, the nature and the quantum of the product produced and brought to the market for sale. The demand side contains information on the number of buyers entering the market for buying the product. Hence the study of market and market structure forms an important feature of micro economics.



5.2 Meaning of Market

In the ordinary sense, the word 'market' refers to a physical place, where commodities and services are bought and sold.

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In Economics, the term 'market' refers to a system of exchange between the buyers and the sellers of a commodity. Besides direct exchanges, there are exchanges that are carried out through correspondence, telephones, online, email etc. A market has the following characteristic features:

1. *Buyers and sellers of a commodity or a service*
2. *A commodity to be bought and sold*
3. *Price agreeable to buyer and seller*
4. *Direct or indirect exchange.*

5.3 Classification of Markets

Market is of various kinds. They are classified:

5.3.1 On the basis of Area:

The market is classified not only on its geographical spread, but also on the nature of the goods exchanged.

i. ***Local market*** arises when products or services are sold and bought in the place of their production. In such markets, the products exchanged are mostly perishable and semi-durable in nature: For example, Vegetable, fruits etc.

ii. ***Provincial market*** arises when products or services are sold and bought in a restricted circle. For example, provincial newspaper.

iii. ***National market*** arises when products and services are sold and bought throughout a country. For example, Nation-wide market for tea, coffee, cement, electrical goods, some printed books etc.

iv. ***International market*** arises when products and services are sold and bought at the world level. For example, petrol, gold etc.

5.3.2 On the basis of Time:

Alfred Marshall classifies market on the basis of time. The 'time' here refers to the nature of the factors, such as fixed factors and variable factors, used in the production process, and how the supply of the products meets with varying demand situations in the determination of price of the products.

i. ***Very short period market or Market Period***

It occurs when with the available time, the quantum supplied of a product cannot be increased (or decreased). Here, the supply curve is vertical; it is inelastic. In this market, the demand force is more active than the supply force in the determination of the price. For example, given an inelastic supply for food, an increase in its demand, as for example, during a flood situation, raises the price of food.

ii. ***Short period market***

It occurs when the quantum supplied of a product can be increased (or decreased) to some extent. Here, the supply curve is a little more elastic. In this period, some factors continue to be fixed and they work a little more intensively to meet an increased demand.

iii. ***Long period market***

It occurs when the quantum supplied of a product can be increased (or decreased) to a larger extent. Here the supply curve is very much elastic. Thus, to meet an increase in demand,

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the quantum of *all* the factors becomes variable. There are no fixed factors here. Therefore, there is a possibility for larger changes in supply. The price of the product cannot be as high as in the case of short run.

iv. ***Very long period market (or a Secular Period Market)***

It occurs when the entire economy undergoes a drastic change. Newer technologies are introduced and most modern products are produced. Several newer methods of production are adopted in the production process, with improvements taking place in technology. For example, the entry of pen-drive has driven out compact disc (CD); as CD has replaced floppies which once replaced tape cassettes.

5.3.3 *On the Basis of Quantity of the Commodity*

i. *Whole-sale market* is for bulk selling and buying of goods (Clothing, Grocery etc.). The price is likely to be low compared to retail market.

ii. *Retail market* is for selling or buying of commodities in small quantities (Clothing, Vegetable etc).

5.3.4 *On the Basis of Competition*

i. *Perfect competition market*

ii. *Imperfect competition market* which comprises monopoly market, monopolistic competition market, duopoly market, oligopoly market etc.

Firm and Industry

Firm: A firm refers to a single production unit in an industry, producing a large or a small quantum of a commodity or service, and selling it at a price in the market. Its main objective is to earn a profit. There may be other objectives as described by managerial and behavioral theories of the firm.

Industry: An industry refers to a group of firms producing the same product or service in an economy. For example, a group of firms producing cement is called a cement industry.

5.4 Equilibrium Conditions for a Firm

Equilibrium of the firm means that the firm reaches the maximum profit. Now, there are two approaches (TC = TR) for calculating the maximum profits

i. Total curve approach; and, ii. Marginal curve approach (MC = MR)

5.4.1 Total curve approach

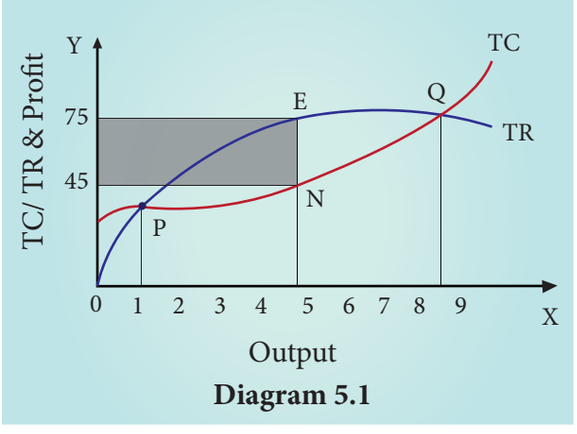


Diagram 5.1

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In the TC-TR Approach, profit is obtained by a firm, through the difference between the TC and the TR. Equilibrium is obtained at the point where maximum difference between the TC and TR occurs. This TC-TR method is not generally adopted in the calculation of maximum profit. Hence to calculate profit / loss, economists resort to the MC=MR approach in the diagram 5.4.1. shaded area denotes profit. Profit is maximum when Q = 5

5.4.2 Marginal curve Approach

In this approach, the following two conditions are to be verified to obtain equilibrium of a firm.

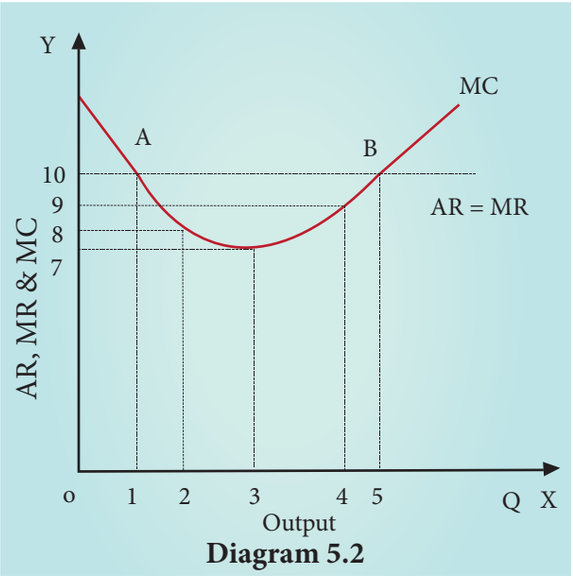


Diagram 5.2

1. MC = MR

Look at the following hypothetical situation. A rational seller will not be in equilibrium at output level 1, though MC=MR at that point, since continuing production, his profit increases. When he produces an output beyond 1 unit till he reaches 5 units, his MC < MR. It is advantageous for the producer to continue his production.

Again, he will not be in equilibrium beyond 5 units of Q, when his MC > MR, implying that the seller incurs loss.

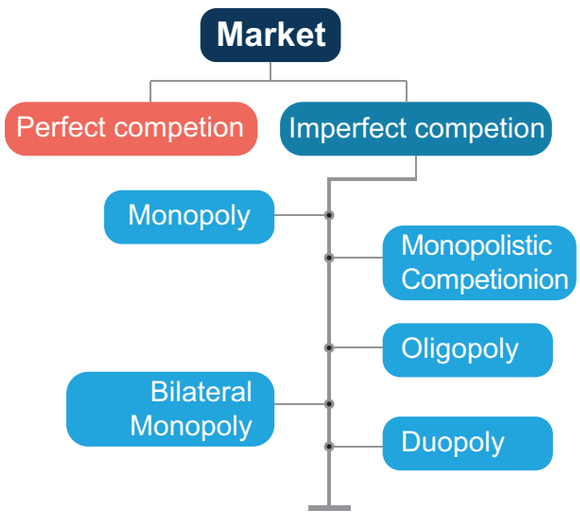
Therefore, he is said to be in equilibrium, i.e., at the point of maximum profit when his MC is equal to MR. Hence, MC = MR is the first condition for the equilibrium. (Note: This is *a necessary condition* but not a sufficient condition).

2. *MC cuts MR curve from below (Sufficient conditions)*

A firm under perfect competition faces a horizontal price line. (It is also the AR curve and the MR curve). A firm under imperfect competition focuses declining price line. The MC is U-shaped and it cuts MR at two points, both *from above* (i.e., at point A) and also *from below* (i.e., at point B), as shown in the diagram.

Only at point B, the equilibrium condition is fulfilled. Thus for equilibrium under all market situations the two conditions viz., MC = MR; and MC cuts MR from below.

Market Structure



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5.5 Perfect Competition:



It is an ideal but imaginary market. 100% perfect competition cannot be seen. Perfect Competition market is that type of market in which the number of buyers and sellers is very large, all are engaged in buying and selling a homogenous product at uniform price without any artificial restrictions and possessing perfect knowledge of the market at a time.

According to Joan Robinson, *"Perfect competition prevails when the demand for the output of each producer is perfectly elastic".*

5.5.1 Features of the Perfect Competition:

a. ***Large Number of Buyers and Sellers***

'A large number of buyers' implies that each individual buyer buys a very, very small quantum of a product as compared to that found in the market. This means that he (he includes she also) has no power to fix the price of the product. He is *only a price-taker and not a price-maker.*

The term, 'large number of sellers' implies that share of each individual seller is a very, very small quantum of a product. This means that he has no power to fix the price of the product. Like the buyer, the seller is also only *a price-taker and not a price-maker.*

b. ***Homogeneous Product and Uniform Price***

The product sold and bought is homogeneous in nature, in the sense that the units of the product are perfectly substitutable. All the units of the product are identical (ie) of the same size, shape, colour, quality etc. Therefore, a *uniform price* prevails in the market.

c. ***Free Entry and Exit***

In the short run, it is possible for the very efficient producer, producing the product at a very low cost, to earn *super normal profits*. Attracted by such a profit, new firms enter into the industry. When large number of firms enter, the supply (in comparison to demand) would increase, resulting in lower price.

An inefficient producer, who is unable to bring down the cost incurs loss. Disturbed by the loss, the existing loss-incurring firms quit the market. If it happens, supply will then decrease, price will go up. Existing firms could earn more profit.

d. ***Absence of Transport Cost***

The prevalence of the uniform price is also due to the absence of the transport cost.

e. ***Perfect Mobility of Factors of Production***

The prevalence of the uniform price is also due to the perfect mobility of the factors of production. As they enjoy perfect freedom to move from one place to another and

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from one occupation to another, the price gets adjusted.

f. ***Perfect Knowledge of the Market***

All buyers and sellers have a thorough knowledge of the quality of the product, prevailing price etc.

g. ***No Government Intervention***

There is no government regulation on supply of raw materials, and in the determination of price etc.

5.5.2 Perfect Competition: Firm's Equilibrium in the Short Run

In the short run, at least a few factors of production are fixed. The firms under Perfect Competition take the price ₹10 from the industry and start adjusting their quantities produced. For example Q_d= 100 – 5P and Q_s=5P. At equilibrium Q_d=Q_s. Therefore 100-5P=5P

100 = 10P; 100/10 = P

P = 10

Q_d = 100-5(10)

100-50 = 50

Q_s = 5(10)=50

Therefore 50 = 50

Q_d = demand

P = Price

Q_s = Supply

This diagram consists of three panels. The equilibrium of an industry is explained in the first panel. The demand and supply forces of all the firms interact and the price is fixed as ₹10. The equilibrium of an industry is obtained at 50 units of output.

In the second part of the diagram, AC curve is lower than the price line. The equilibrium condition is achieved where MC=MR. Its equilibrium quantity sold is 50. With the prevailing price, ₹10 it experiences super normal profit. AC = ₹8, AR = ₹10.

Price & Output Determination-Perfect Competition during Short Run

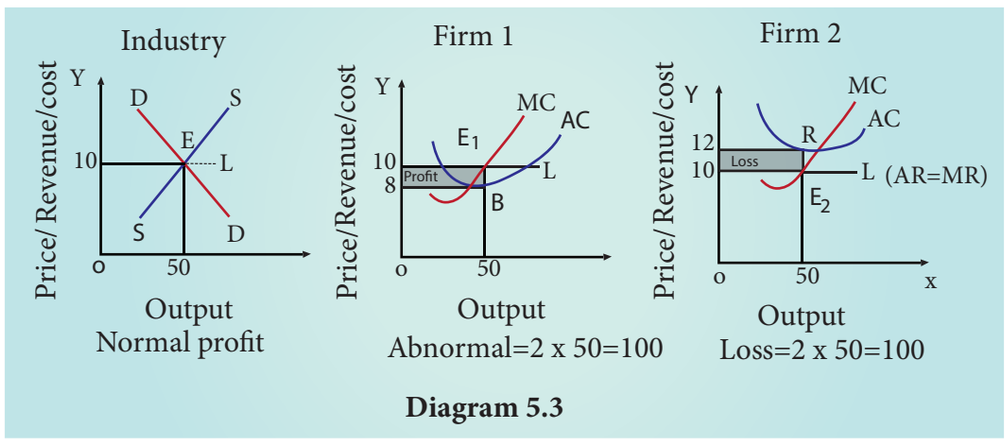


Diagram 5.3

SS – market supply
DD – market demand
AR – Average Revenue
AC – Average Cost
MR – Marginal Revenue
MC – Marginal Cost

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Its total revenue is 50X10=500. Its total cost is 50X8=400. Therefore, its total profit is 500-400=100.

In the third part of the diagram, firm's cost curve is above the price line. The equilibrium condition is achieved at the point where MR=MC. Its quantity sold is 50. With the prevailing price, it experiences loss. (AC>AR)

Its total revenue is 50X10=500. Its total cost is 50X12=600. Therefore, its total loss is 600-500=100.

As *profit* prevails in the market, new firms will enter the industry, thus increasing the supply of the product. This means a decline in the price of the product and increase the cost of production. Thus, the abnormal profit will be wiped out; loss will be incurred.

When *loss* prevails in the market, the existing loss making firms will exit the industry, thus decreasing the supply of the product. This means a rise in the price of the product and reduction in the cost of production. So the loss will vanish; Profit will emerge. Consequent upon the entry and exit of new firms into the industry, firms always earn 'normal profit' in the long run as shown in diagram.

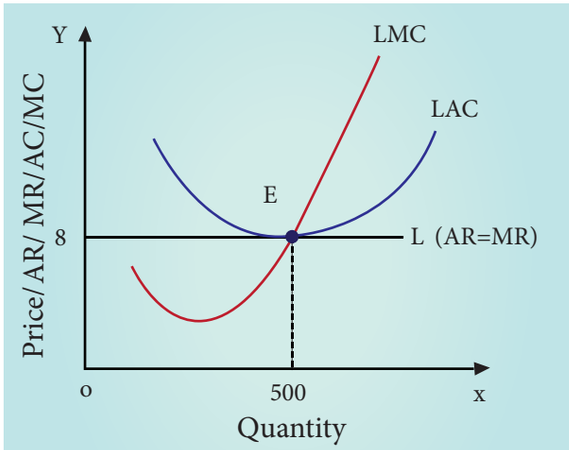


Diagram 5.4

5.5.3 Perfect Competition: Firm's Equilibrium in the Long Run (Normal Profit)

In the long run, all the factors are variable.

The LAC curve is an envelope curve as it contains a few average cost curves. It is a flatter U shaped one. It is also known as planning curve. First, the firms will earn *only normal profit*.

Secondly, all the firms in the market are in equilibrium. This means that there should neither be a tendency for the new firms to enter into the industry nor for any of the existing firms to exit from the industry.

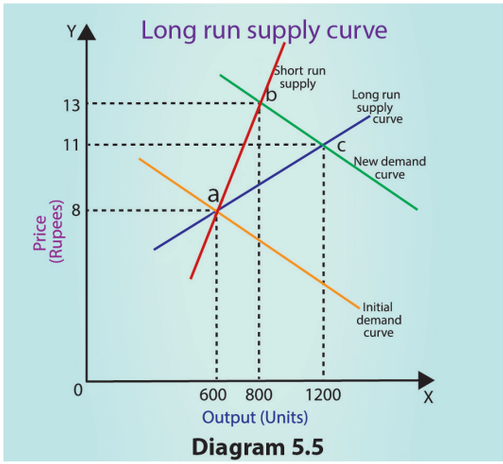


Diagram 5.5

Long run supply curve is explained to determine the long run price after an increase in demand. The effect of the increase in demand in the short run is explained by the movement from point 'a' to point 'b'. The price increases from ₹8 to ₹13, and the quantity increases from 600 to 800 units. Economic profit of a firm is

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positive. Therefore, new firms enter the market. In the long run new firms entry will continue until the price drops to ₹11 and the quantity is 1,200 units. The new long run equilibrium is shown by point 'c', where the new demand curve intersects supply curve, at this price level (₹11) and quantity (1,200 units). Due to diminishing returns, it is very difficult to increase output in the short tun, as a result the price will increase to cover these higher cost of production. New firms will enter into the market. The price gradually drops to the point (₹11) at which each firm makes zero economic profit.

A firm under perfect competition even in the long run is a price – taker, not a price – maker. It takes the price of the product from the industry. And it superimposes its cost curves on the revenue curves.

Long run equilibrium of the firm is illustrated in the diagram. Under perfect competition, long run equilibrium is only at minimum point of LAC. At point E, LMC = MR = AR = LAC.

In the above diagram (5.4), average cost is equal to average revenue. The equilibrium of the firm finally rests at point E where price is 8 and output is 500. (Numbers are hypothetical) At this point, the profit of the firm is only normal. Thus condition for long run equilibrium of the firm is:

Price = AR=MR = Minimum AC

At the equilibrium point, the SAC > LAC. Hence, long run equilibrium price is lower than short run equilibrium price; long run equilibrium quantity is larger than short run equilibrium quantity.

5.6 Imperfect Competition



Mrs. Joan Robinson
1903-1983



Edward Chamberlin
1899 -1967

The concept of imperfect competition was propounded in 1933 in England by Mrs.Joan Robinson and in America by E.H. Chamberlin.

It is an important market category where the individual firms exercise their control over the price.

Definition: Imperfect competition is a competitive market situation where there are many sellers, but they are selling heterogeneous (dissimilar) goods as opposed to the perfect competitive market scenario. As the name suggests, competitive markets are imperfect in nature.

Description: Imperfect competition is the real world competition. Today some of the industries and sellers follow it to earn surplus profits. In this market scenario,

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the seller enjoys the luxury of influencing the price in order to earn more profits.

If a seller is selling a non-identical good in the market, then he can raise the prices and earn profits. High profits attract other sellers to enter the market and sellers, who are incurring losses, can very easily exit the market.

5.7 Monopoly



Indian Railways

Meaning:

The word monopoly has been derived from the combination of two Greek words i.e., 'Mono' and 'Poly'. Mono refers to a single and "poly" to seller.

In this way, monopoly refers to a market situation in which there is only one seller of a commodity. Hence, there is no scope for competition. (Still some economists observe that there will always be potential threat to the monopolists).

Definition

Monopoly is a market structure characterized by a single seller, selling the unique product with the restriction for a new firm to enter the market. Monopoly is a form of market where there is a single seller selling a particular commodity for which there are no close substitutes.

5.7.1 Features of Monopoly

1. There is a single producer / seller of a product;
2. The product of a monopolist is unique and has no close substitute;
3. There is strict barrier for entry of any new firm;
4. The monopolist is a price-maker;
5. The monopolist earns maximum profit/ abnormal profit.

5.7.2 Sources of Monopoly Power

1. **Natural Monopoly:**

   Ownership of the natural raw materials [Eg.Gold mines (Africa), Coal mines, Nickel (Canada) etc.]

2. **State Monopoly:**

   Single supplier of some special services (Eg.Railways in India)

3. **Legal Monopoly:**

   A monopoly firm can get its monopoly power by getting patent rights, trade mark from the government.

5.7.3 Price & Output Determination Under Monopoly

A monopoly is a one firm-industry. Therefore, a firm under monopoly faces a downward sloping demand curve (or AR curve). Since, under monopoly AR falls,

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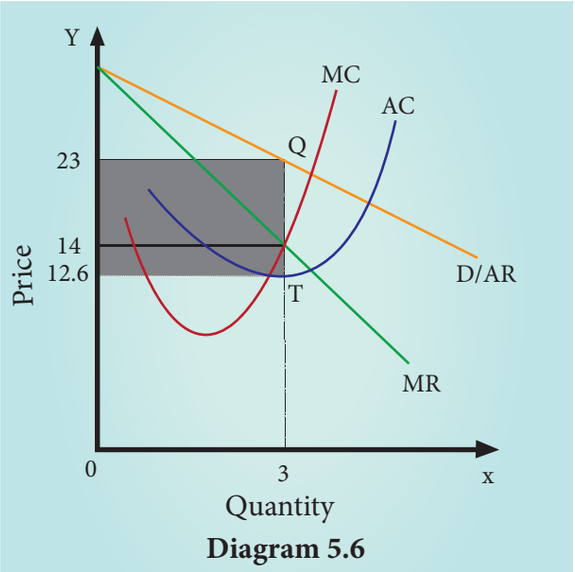


Diagram 5.6

as more units of output are sold, the MR lies below the AR curve (MR<AR).

The monopolist will continue to sell his product as long as his MR>MC.

He attains equilibrium at the level of output when its MC is equal to MR. Beyond this point, the producer will experience loss and hence will stop selling.

From this diagram, till he sells 3 units output, MR > MC. The monopoly firm will be in equilibrium at the level of output where MR is equal to MC. The price is 23.

To checkup how much profit the monopolist is making at the equilibrium output, the average revenue curves and the average cost curves are used. At equilibrium level of output, (3) the average revenue is 23 and the average cost is 12.67, therefore (23-12.67) = 10.33 is the profit per unit.

Total profit = (Average Revenue – Average Cost) X Total output

$= (23 - 12.67) \times 3$

$= 10.33 \times 3 = 30.99$

5.7.4 Price Discrimination under monopoly

A discriminating monopoly is a single entity that charges different prices for different consumers. Higher price will be charged for price inelastic consumers and vice versa

Types of Price Discrimination

There are three types of price discrimination.

(i) ***Personal*** – Different prices are charged for different individuals (for example, the railways give tickets at concessional rate to the *'senior citizens'* for the same journey).

(ii) ***Geographical*** - Different prices are charged at different places for the same product (for example, a book sold within India at a higher price is sold in a foreign country at lower price). On this basis, China drops its goods in Indian market. As a result, Indian watches and toys industries closed down their business.

(iii) **On the basis of Use** - Different prices are charged according to the use of a product (for example, lower rates are charged by Tamil Nadu Electricity Board for domestic uses of electricity and higher rates are charged for commercial and industrial uses).

5.7.5 Degrees of Price Discrimination

Price discrimination has become widespread in almost all monopoly markets. According to A.C.Pigou, there are three degrees of price discrimination.

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(i) First degree price discrimination

A monopolist charges the maximum price that a buyer is willing to pay. This is called perfect price discrimination. This price wipes out the entire consumer's surplus. This is maximum exploitation of consumers. Mrs.Joan Robinson named it as "Perfect Discriminating Monopoly"

(ii) Second degree price discrimination

Under this degree, buyers are charged prices in such a way that a part of their consumer's surplus is taken away by the sellers. This is called imperfect price discrimination. Mrs.Joan Robinson named it as "Imperfect Discriminating Monopoly". Under this degree, buyers are divided into different groups and a different price is charged for each group. For example, in cinema theatres, prices are charged for same film show from viewers of different classes. In a theatre the difference between the first row of first class and the last row in the second class is smaller as compared to the differences in charges.

(iii) Third degree price discrimination

The monopolist splits the entire market into a few sub-markets and charges different prices in each sub-market. The groups are divided on the basis of age, sex and location. For example, railways charge lower fares from senior citizens. Students get discounts in museums, and exhibitions.

5.7.6 Dumping

Dumping refers to practice of the monopolist charging higher price for his product in the local market and lower price in the foreign market. Through dumping, a country expands its command over other countries for its product. This is also called as 'International Price Discrimination".

For example, India's electronic market is flooded with the China's products.

5.8 Monopolistic Competition

Monopolistic competition refers to a market situation where there are many firms selling a differentiated product. There is competition which is keen, though not perfect, among many firms making very similar products. No firm can have any perceptible influence on the price-output policies of the other sellers nor can it be influenced much by their actions. Thus monopolistic competition refers to competition among a large number of sellers producing close but not perfect substitutes for each other.

5.8.1 Features of monopolistic competition

The important features of monopolistic competition are :

1. There are large number of buyers and many sellers.

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2. Firms under monopolistic competition are price makers. They set their own prices.
3. Firms produce differentiated products. It is the key element of monopolistic competition.
4. There is a free entry and exit of firms.
5. Firms compete with each other by incurring selling cost or expenditure on sales promotion of their products.
6. Non – price competition is an essential part of monopolistic competition.
7. A firm can follow an independent price policy.

5.8.2 Price and Output Determination under Monopolistic Competition

The firm under monopolistic competition achieves its equilibrium when it's MC = MR, and when its MC curve cuts its MR curve from below. If MC is less than MR, the sellers will find it profitable to expand their output.

Under monopolistic competition

(1) The demand curve is downwards sloping.

(2) There are close substitutes.

(3) The demand curve (the average revenue curve) is fairly elastic.

Under monopolistic competition, different firms produce different varieties of the product and sell them at different prices. Each firm under monopolistic competition seeks to achieve equilibrium as regards

1. Price and output, 2. Product adjustment and 3. selling cost adjustment.

Short-run equilibrium:

How does a monopolistically competitive firm achieve price-output level equilibrium? The profit maximisation is achieved when MC=MR.

'OM' is the equilibrium output. 'OP' is the equilibrium price. The total revenue is 'OMQP'. And the total cost is 'OMRS'. Therefore, total profit is 'PQRS'. This is super normal profit under short-run.

But under differing revenue and cost conditions, the monopolistically competitive firms may incur loss.

As shown in the diagram, the AR and MR curves are fairly elastic. The equilibrium

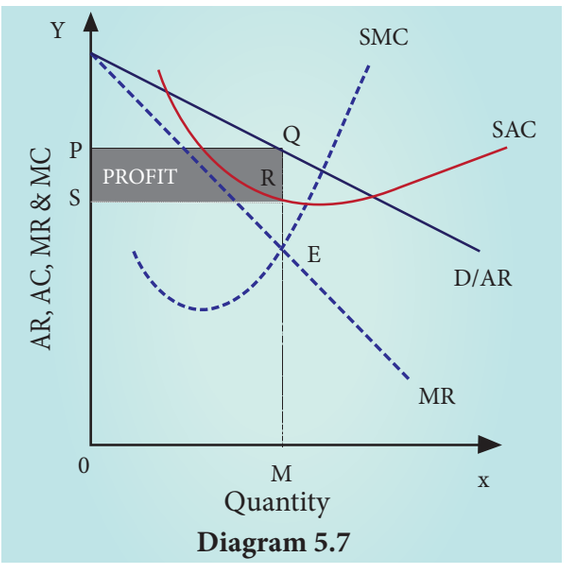


Diagram 5.7

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situation occurs at point 'E', where MC = MR and MC cuts MR from below.

The equilibrium output is OM and the equilibrium price is OP.

In the diagram (5.8) given below, the total revenue of the firm is 'OMQP' and the total cost of the firm is 'OMLK' and thus the total loss is 'PQLK'. This firm incurs loss in the short run.

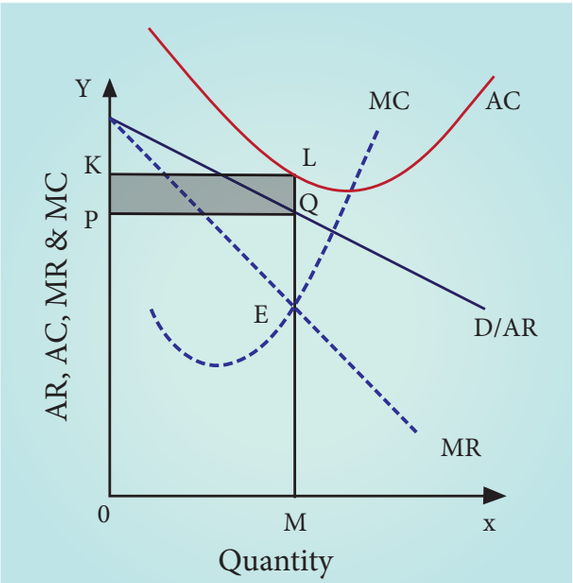


Diagram 5.8

Long-Run Equilibrium of the Firm and the Group Equilibrium

In the short run a firm under monopolistic competition may earn super normal profit or incur loss. But in the long run, the entry of the new firms in the industry will wipe out the super normal profit earned by the existing firms. The entry of new firms and exit of loss making firms will result in normal profit for the firms in the industry.

In the long run AR curve is more elastic or flatter, because plenty of

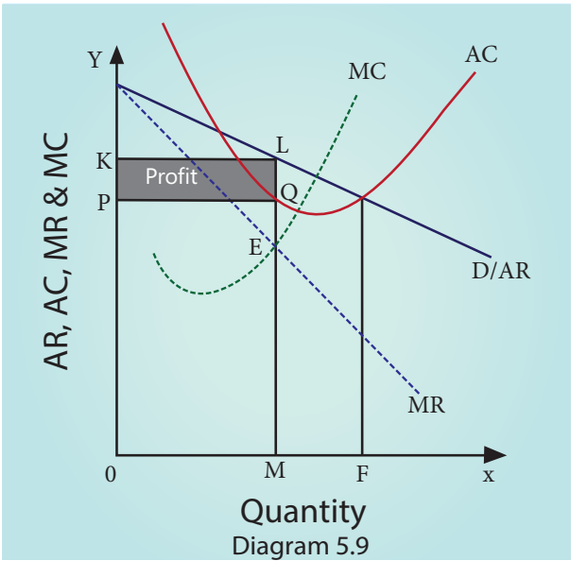


Diagram 5.9

substitutes are available. Hence, the firms will earn only normal profit.

In the diagram equilibrium is achieved at point 'E'. The equilibrium output is 'OM' and the equilibrium price is 'OP'. The average revenue at the equilibrium output is 'MQ' and the average cost is also 'MQ'. Thus, in the long run under monopolistic competition, there is equilibrium when AR=AC and MC=MR. It means that a firm earns normal profit. AR is tangent to the Long Run Average Cost (LAC) curve at point 'Q'.

The only one condition for equilibrium in the short run	:	*MC = MR.*
The two conditions for equilibrium in the long run	:	*MC = MR and AC = AR.*

5.8.3 Wastes of Monopolistic Competition

Generally there are five kinds of wastages under monopolistic competition.

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1. **Idle Capacity:** Unutilized capacity is the difference between the optimum output that can be produced and the actual output produced by the firm. In the long run, a monopolistic firm produces delibrately output which is less than the optimum output that is the output corresponding to the minimum average cost. This is done so mainly to create artificial scarcity and raise price. This leads to excess capacity which is actually a waste in monopolistic competition. In diagram 5.9, MF quantity of output refers to unused capacity. If OF is produced, the society will get larger quantity with lower price.

2. **Unemployment:** Under monopolistic competition, the firms produce less than optimum output. As a result, the productive capacity is not used to the fullest extent. This will lead to unemployment of human resources also.

3. **Advertisement (Selling cost):** There is a lot of wastes in competitive advertisements under monopolistic competition. The wasteful and competitive advertisements lead to high cost to consumers. It is also claimed that advertisements cheat the consumers by giving false, information about the product.

4. **Too Many Varieties of Goods:** Introducing too many varieties of a good is another waste of monopolistic competition. The goods differ in size, shape, style and colour. A reasonable number of varieties would be sufficient. Cost per unit can also be reduced, if only a few varieties are produced in larger quantity instead of larger varieties with small quantity.

5. **Inefficient Firms:** Under monopolistic competition, inefficient firms charge prices higher than their marginal cost. Such type of inefficient firms should be kept out of the industry. But, the buyers' preference for such products mostly due to emotions, enables the inefficient firms to continue to exist. Efficient firms cannot drive out the inefficient firms because sometimes the Efficient firms may not be able to spend money on attractive advertisement to lure the buyers. In reality, the consumers are mostly emotional rather than rational, as stated by Richard Theiler, the Nobel prize winner for the year 2017.Rational decisions are made by mind; emotional decisions are made by heart.

5.9 Duopoly

Duopoly is a special case of the theory of oligopoly. In duopoly there are only two sellers. Both the sellers are completely independent and no agreement exists between them. Even though they are independent, a change in the price and output of one will affect the other, and may set a chain of reactions. A seller may,

Monopsony

Monopsony is a market structure in which there is only one buyer of a good or service. If there is only one customer for a certain good, that customer has monopsony power in the market for that good. Monopsony is analogous to monopoly, but monopsony has market power on the demand side rather than on the supply side.

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Bilateral Monopoly:

Bilateral monopoly refers to a market situation in which a single producer (monopolist) of a product faces a single buyer (monopsonist) of that product.

however, assume that his rival is unaffected by what he does, in that case he takes only his own direct influence on the price.

5.9.1 Characteristics of Duopoly

1. Each seller is fully aware of his rival's motive and actions.
2. Both sellers may collude (they agree on all matters regarding the sale of the commodity).
3. They may enter into cut-throat competition.
4. There is no product differentiation.
5. They fix the price for their product with a view to maximising their profit.

5.10 Oligopoly

Oligopoly is a market situation in which there are a few firms selling homogeneous or differentiated products. Examples are oil and gas. It is difficult to pinpoint the number of firms in 'competition among the few.' With only a few firms in the market, the action of one firm is likely to affect the others.



5.10.1 Features of Oligopoly

1. ***Few* large firms**

   Very few big firms own the major control of the whole market by producing major portion of the market demand.

2. ***Interdependence among firms***

   The price and quality decisions of a particular firm are dependent on the price and quality decisions of the rival firms.

3. ***Group behaviuor***

   The firms under oligopoly realise the importance of mutual co-operation.

4. ***Advertisement cost***

   The oligopolist could raise sales either by advertising or improving the quality of the product.

5. ***Nature of product***

   Perfect oligopoly means homogeneous products and imperfect oligopoly deals with heterogeneous products.

6. ***Price rigidity***

   It implies that prices are difficult to be changed. The oligopolistic firms do not change their prices due to the fear of rivals' reaction.

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5.11 Comparison among the Features of Various Markets

S No	Features	Perfect Competition	Monopoly	Monopolistic Competition
1	**Number of Producers/Sellers**	Innumerable	Only One	Large
2	**Nature of the Product**	Homogeneous Perfect Substitute	Unique (No close substitute)	Differentiated Product (close substitutes)
3	**Control over Price**	Price-Taker	Price-Maker	Some control depending on branded loyalty
4	**Entry / Exit**	Free	Barriers to entry	Free
5	**Profit**	Abnormal profit / loss in short-run, Normal profit in long-run	Monopoly Profit	Abnormal profit in short-run, Normal profit in long run
6	**Market Knowledge**	Complete	Complete	Partial
7	**AR Curves**	Parallel to X axis Perfectly elastic	Fairly Flat More elastic	Steep (highly inelastic)
8	**Quantity**	Very large	Less compared to perfect competition	Substantial
9	**Price**	Uniform and low	High	Moderate and varied
10	**Market power**	Nil	Absolute	Limited

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5.12 Conclusion

Different forms and characteristics of different markets have been studied in this chapter Market, in general is divided into perfect market and imperfect market. Imperfect market consists of Monopoly, Monopolistic Competition, Duopoly, Monopsony etc. In the long-run, firms earn normal profit. Under imperfect market, the sellers would manage to reap larger profits depending upon the degree of monopoly power.

Glossary

Equilibrium A situation or a state at which a firm seeks to rest.

Equilibrium Price The price at which the quantity demanded of a good equals quantity supplied.

Firm A single organization which employs factors of production to produce goods and sells.

Long run The period of time during which all factors of production are variable.

Marginal cost Addition made to total costs already incurred by producing one more unit of the commodity.

Marginal revenue Addition made to total revenue already incurred by selling one more unit of the commodity.

Monopolist A single-seller who controls entire or major part of output, which has no close substitutes.

Price-maker The power in the firm to set the price for goods in the market.

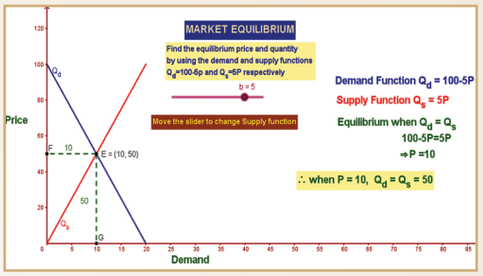
Price-taker The feature of a firm to accept the price fixed in the industry.

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ICT CORNER

MARKET EQUILIBRIUM

Lets study of Equilibrium for Quantity on Demand and Quantity Supplied.



Steps:

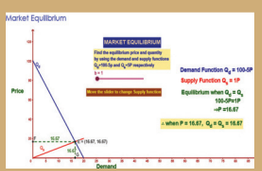
- Open the Browser type the URL given (or) Scan the QR Code.
- GeoGebra Work book called "XI STD ECONOMICS" will appear. In this several work sheets for Economics are given, Open the worksheet named "Market Equilibrium"
- There are two equations 1. Quantity on Demand (QD) and 2. Quantity Supplied (QS). Both the equations are drawn in the graph as straight line. Observe both the lines intersect at a point E.
- That intersection point is called 'Market Equilibrium'. At that point both QD and QS are Equal. Thus, Market equilibrium is obtained when Demand and Supply are equal. Now you change the Supply function by moving the slider "b". Observe the Equilibrium changes as the supply changes. Now Analyse the Market structure required.



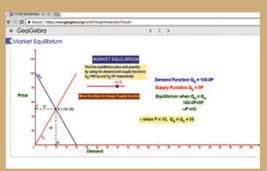
Step1



Step2



Step3



Step4

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MODEL QUESTIONS

Part-A Multiple Choice Questions

1. Which of the following is a market structure where the Price is expected to be lower?
   - **a.** Perfect competition
   - **b.** Monopoly
   - **c.** Duopoly
   - **d.** Oligopoly

2. Equilibrium condition of a firm is.....
   - **a.** MC = MR **b.** MC > MR
   - **c.** MC < MR **d.** MR = Price

3. Which of the following is a feature of monopolistic competition?
   - **a.** One seller
   - **b.** Few sellers
   - **c.** Product differentiation
   - **d.** No entry

4. A firm under monopoly can earn ..... in the short run.
   - **a.** Normal profit
   - **b.** Loss
   - **c.** Super normal profit
   - **d.** More loss

5. There is no excess capacity under .....
   - **a.** Monopoly
   - **b.** Monopolistic competition
   - **c.** Oligopoly
   - **d.** Perfect competition

6. Profit of a firm is obtained when .....
   - **a.** TR < TC
   - **b.** TR - MC
   - **c.** TR > TC
   - **d.** TR = TC



7. Another name of price is.....
   - **a.** Average Revenue
   - **b.** Marginal Revenue
   - **c.** Total Revenue
   - **d.** Average Cost

8. In which type of market, AR and MR are equal .....
   - **a.** Duopoly
   - **b.** Perfect competition
   - **c.** Monopolistic competition
   - **d.** Oligopoly

9. In monopoly, MR curve lies below .....
   - **a.** TR
   - **b.** MC
   - **c.** AR
   - **d.** AC

10. Perfect competition assumes .....
    - **a.** Luxury goods
    - **b.** Producer goods
    - **c.** Differentiated goods
    - **d.** Homogeneous goods

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11. Group equilibrium is analysed in …….

a. Monopolistic competition

b. Monopoly

c. Duopoly

d. Pure competition

12. In monopolistic competition, the essential feature is …..

a. Same product

b. selling cost

c. Single seller

d. Single buyer

13. Monopolistic competition is a form of ……..

a. Oligopoly

b. Duopoly

c. Imperfect competition

d. Monopoly

14. Price leadership is the attribute of ……..

a. Perfect competition

b. Monopoly

c. Oligopoly

d. Monopolistic competition

15. Price discrimination will always lead to…….

a. Increase in output

b. Increase in profit

c. Different prices

d. b and c

16. The average revenue curve under monopolistic competition will be……

a. Perfectly inelastic

b. Perfectly elastic

c. Relatively elastic

d. Unitary elastic

17. Under perfect competition, the shape of demand curve of a firm is.....

a. Vertical

b. Horizontal

c. Negatively sloped

d. Positively sloped

18. In which market form, does absence of competition prevail?

a. Perfect competition

b. Monopoly

c. Duopoly

d. Oligopoly

19. Which of the following involves maximum exploitation of consumers?

a. Perfect competition

b. Monopoly

c. Monopolistic competition

d. Oligopoly

20. An example of selling cost is …

a. Raw material cost

b. Transport cost

c. Advertisement cost

d. Purchasing cost

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Part-A Answers

1	2	3	4	5	6	7	8	9	10
a	a	c	c	d	c	a	b	c	d
11	12	13	14	15	16	17	18	19	20
a	b	c	c	d	c	b	b	b	c

Part-B Answer the following questions in one or two sentences.

21. Define Market.

22. Who is price-taker?

23. Point out the essential features of pure competition.

24. What is selling cost?

25. Draw demand curve of a firm for the following:

a) Perfect Competition b) Monopoly

26. Mention any two types of price discrimination

27. Define "Excess capacity".

Part-C Answer the following questions in one paragraph.

28. What are the features of a market?

29. Specify the nature of entry of competitors in perfect competition and monopoly.

30. Describe the degrees of price discrimination.

31. State the meaning of selling cost with an example.

32. Mention the similarities between perfect competition and monopolistic competition.

33. Differentiate between 'firm' and 'industry'.

34. State the features of duopoly.

Part-D Answer the following questions in about a page

35. Bring out the features of perfect competition.

36. How price and output are determined under the perfect competition?

37. Describe the features of oligopoly.

38. Illustrate price and output determination under Monopoly.

39. Explain how price and output are determined under monopolistic competition with help of a diagram.

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ACTIVITY-1

Divide the class into five groups. Assign each group a market structure; for first group perfect competition, second group monopoly, third group oligopoly, forth group duopoly and for fifth group monopolistic competition. Now each student is to identify a business or organization or seller that operate in that market structure. Ask each student to prepare a brief description of the following.

1. Name of the market structure
2. Business name
3. Industry
4. Identify the conditions of market structure
5. What are prices of a particular product, whether same price or different price?.
6. Is there non-price competition?

ACTIVITY-2

Find out the number of firms in Tamil Nadu or India which are producing/selling TV and Mobile phones.

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CHAPTER

6 Distribution Analysis

"Distribution accounts for the sharing of wealth produced by a community among the agents or owners of the factors which have been active in its production"

–Chapman

Learning Objectives

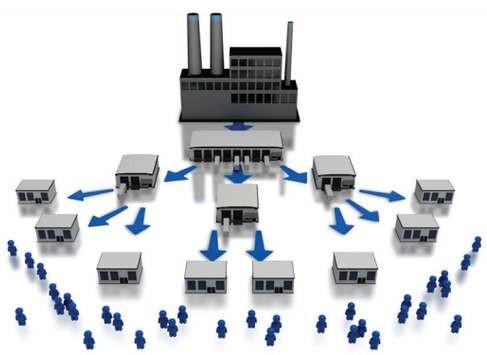
1. To acquire knowledge about distribution of income among the factors of production.
2. To enable the students to understand the theories of rent, wages, interest and profit.

6.1 Introduction

The factors of production viz., Land, Labour, Capital and Entrepreneur or Organization are involved in production. The theory of functional distribution deals with how the relative prices of these factors of production are determined. The theory of factor prices is popularly known as the theory of distribution. Interesting aspect here is in the fact that large number of ideas has emerged and various factors have been identified the economists, contributing to the development of Economics Science.

6.2 Meaning of Distribution

Distribution means division of income among the four factors of production in terms of rent to landlords, wage to labourer, interest to capital and profit to entrepreneurs.



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6.3 Kinds of Distribution of Income

Personal Distribution

Personal Distribution is the distribution of national income among the individuals.



Functional Distribution

Functional Distribution means the distribution of income among the four factors of production namely land, labour, capital and organisation for their services in production process.

6.4 Marginal Productivity Theory of Distribution

Introduction

Marginal Productivity Theory of distribution was developed by Clark, Wickseed and Walras. This theory explains how the prices of various factors of production are determined. This theory explains how rent, wages, interest and profit are determined. This theory is also known as "General Theory of Distribution" or "National Dividend Theory of Distribution".

V2C0Y

Assumptions

This theory is based on the following assumptions:

1. All the factors of production are homogenous.
2. Factors of production can be substituted for each other.
3. There is perfect competition both in the factor market and product market.
4. There is perfect mobility of factors of production.
5. There is full employment of factors.
6. This theory is applicable only in the long-run.
7. The entrepreneurs aim at profit maximization.
8. There is no government intervention in fixing the price of a factor.
9. There is no technological change.

Explanation of the Theory

According to the Marginal Productivity Theory of Distribution, the price or the reward for any factor of production is equal to the marginal productivity of that factor. In short, each factor is rewarded according to its marginal productivity.

Marginal Product

The Marginal product of a factor of production means the addition made to the total product by employment of an additional unit of that factor. The Marginal Product may be expressed as MPP, VMP and MRP.

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1. **Marginal Physical Product (MPP)**

The Marginal Physical Product of a factor is the increment in the total product obtained by the employment of an additional unit of that factor.

2. **Value of Marginal Product (VMP)**

The Value of Marginal Product is obtained by multiplying the Marginal Physical Product of the factor by the price of product.

Symbolically

VMP = MPP x Price

3. **Marginal Revenue Product (MRP)**

The Marginal Revenue Product of a factor is the increment in the total revenue which is obtained by the employment of an additional unit of that factor.

MRP = MPP x MR

Statement of the Theory

An employer employs a factor of production because it is productive. So, the price he wants to pay for the factor depends upon its productivity. The greater the productivity of a factor, the higher will be its reward. If the price of a factor of production is less than its marginal revenue product, the employer will use more of this factor, because his profit will be increased.

When more of a factor is employed, its marginal revenue product diminishes. But the employer will gain by using additional units of the factor until the marginal revenue product of the factor is equal to its price. The employer's profit will be maximum at this point. Beyond the point, the marginal revenue product is less than the price of the factor. Hence, employer will suffer loss when he uses more of the factor. Therefore, the conclusion is that the employer will adjust the price of the factor of production so as to equalize the marginal revenue product of that factor.

In short, the Marginal Productivity Theory of Distribution states that

a) The price of a factor of production depends upon its productivity.

b) The price of a factor is determined by and will be equal to marginal revenue product of that factor.

c) Under certain conditions, the price of a factor will be equal to both the average and marginal products of that factor.

The Marginal Productivity Theory of Distribution can be represented diagrammatically as follows:

Marginal Productivity under Perfect Competition

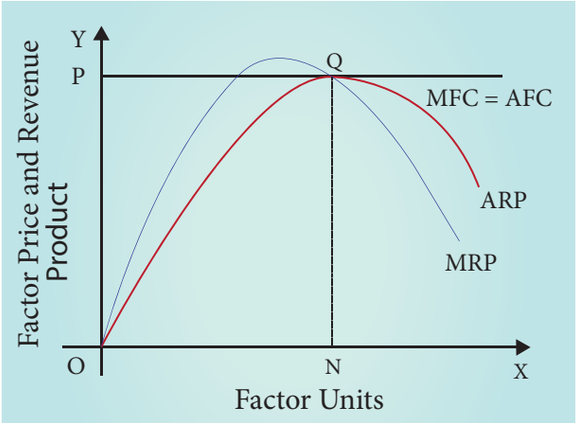


Diagram 6.1

The diagram 6.1 refers to the factor pricing under perfect competition in the factor market. X axis represents factor units

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and Y axis represents the factor price and revenue product. MRP is the Marginal Revenue Product Curve and ARP is the Average Revenue Product curve. AFC is the Average Factor Cost curve and MFC is the Marginal Factor Cost curve. AFC is horizontal under perfect competition and MFC coincides with it.

When there is perfect competition in the factor market, the firm is in equilibrium (i.e., earning maximum profits) only when MFC = MRP. Hence, in the diagram, the firm reaches equilibrium at point Q by employing ON units of factors and paying OP price (NQ) where MFC = MRP. At the point Q, MRP = ARP. The price paid to the factor (NQ) is also equal to marginal revenue product (NQ) and average revenue product (NQ). This means that there is no exploitation of factors under perfect competition. Beyond the point Q, no employer will employ factors, because after that point, the price paid to the factor is more than marginal revenue product and average revenue product.

Marginal Productivity Theory under Imperfect Competition

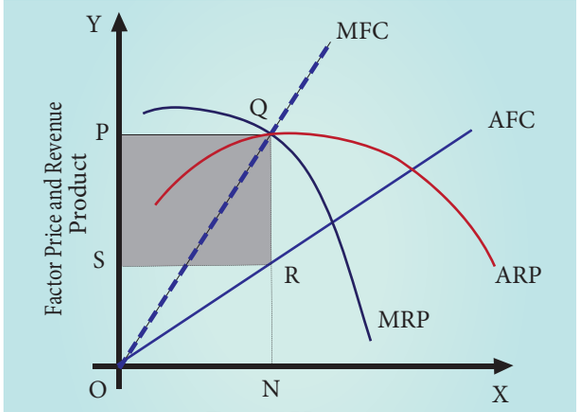


Diagram 6.2

In diagram 6.2 the factor pricing under imperfect competition is represented. AFC is Average Factor Cost curve. It represents the price paid to the factors. It increases as the number of factors demanded by the employer increases. As AFC rises, MFC lies above AFC. It represents the marginal cost paid to the factors. At the point Q, MFC = MRP, where the employer attains his maximum profit and so he stops employment of the factors at the point. But the average cost paid is NRSO and the average revenue obtained is NQ or OP. Total revenue obtained is NQPO. Therefore, exploitation per unit of factor is RQ. But the total number of factors is ON. Thus, the total exploitation of factor by the employer is RQSR = PQRS (shaded area). Thus, under imperfect competition, factor is exploited at the equilibrium position.

Criticism

This theory is subject to a few criticisms

1. In reality, the factors of production are not homogenous.
2. In practice, factors cannot be substituted for each other.
3. This theory is applicable only in the long–run. It cannot be applied in the short-run.

6.5 Rent

6.5.1 Meaning

Rent is the price or reward given to the owner, for the use of land or house or a machine. But in Economics, "Rent" or "Economic Rent" refers to that part of

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payment made by a tenant to his landlords for the use of land only.



6.5.2 Ricardian Theory of Rent



David Ricardo

The Classical Theory of Rent is called "Ricardian Theory of Rent". David Ricardo explained the theory of rent thus:

Assumptions

Ricardian theory of rent assumes the following:

> "Rent is that portion of the produce of the earth which is paid to the landlord for the use of the original and indestructible powers of the soil".
>
> ***David Ricardo***

1. Land differs in fertility.
2. The law of diminishing returns operates in agriculture.
3. Rent depends upon fertility and location of land.
4. Theory assumes perfect competition.
5. It is based on the assumption of long period.
6. There is existence of marginal land or no-rent land.
7. Land has certain "original and indestructible powers".
8. Land is used for cultivation only.
9. Most fertile lands are cultivated first.

Statement of the Theory with Illustration

Assume that some people go to a newly discovered island and settle down there. There are three grades of land, namely A, B and C in that island. 'A' being most fertile, 'B' less fertile and 'C' the least fertile. They will first cultivate all the most fertile land (A grade) available. Since the land is abundant and idle, there is no need to pay rent as long as such best lands are freely available. Given a certain amount of labour and capital, the yield per acre on 'A' grade land is 40 bags of paddy.

Suppose another group of people goes and settles down in the same island after some time. Hence the demand for agricultural produce will increase. The most fertile lands [A grade] alone cannot produce all the food grains that are needed on account of the operation of the law of diminishing returns. So the less fertile lands [B grade] will have to be brought under cultivation in order to

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meet the food requirements of the growing population. For the same amount labour and capital employed in '**A**' grade land, the yield per acre on 'B' grade land is 30 bags of paddy. The surplus of 10 bags [40-30] per acre appears on 'A' grade land. This is "Economic Rent" of 'A' grade land.

Suppose yet another group of people goes and settles down in the same island. So the least fertile land (C grade) will have to be brought under cultivation. For the same amount of labour and capital, the yield per acre on 'C' grade land is 20 bags of paddy. This surplus of 'A' grade land is now raised to 20 bags [40-20], and it is the "Economic Rent" of 'A' grade land. The surplus of 'B' grade land is 10 bags [30-20]. This is the economic rent of 'B' grade land.

In the above illustration in 'C' grade land, cost of production is just equal to the price of its produce and therefore does not yield any rent (20 - 20). Hence, 'C' grade land is called "no-rent land or marginal land". Therefore, No-Rent Land or Marginal Land is the land in which cost of production is just equal to the price of its produce. The land which yields rent is called "intra–marginal land". Therefore, rent indicates the differential advantage of the superior land over the marginal land.

Table 6.1 Ricardian Theory of Rent

Grades of Lands	*Production (in bags)*	*Surplus (i.e., Rent in bags)*
A	40	40-20=20
B	30	30-20= 10
C	20	20-20= 0

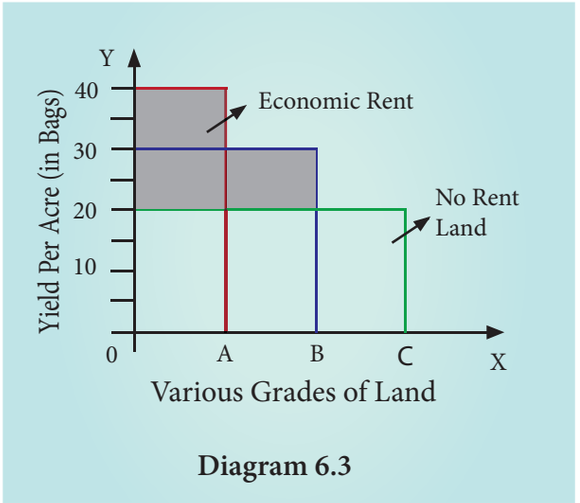


Diagram 6.3

Diagrammatic Explanation

In diagram 6.3, X axis represents various grades of land and Y axis represents yield per acre (in bags). OA, AB and BC are the 'A' grade, 'B' grade and 'C' grade lands respectively. The application of equal amount of labour and capital on each of them gives a yield represented by the rectangles standing just above the respective bases. The 'C' grade land is the "no–rent land" 'A' and 'B' grade lands are "intra–marginal lands". The economic rent yielded by 'A' and 'B' grade lands is equal to the shaded area of their respective rectangles.

Criticisms

Following are the limitations of Ricardian theory of rent.

1. The order of cultivation from most fertile to least fertile lands is historically wrong.
2. This theory assumes that, rent does not enter into price. But in reality, rent enters into price.

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6.5.3 Quasi-Rent



Marshall introduced the concept of Quasi rent. Factors other than land say plant and machinery are fixed in supply during short period. They earn surplus income when demand rises. It is purely temporary as it disappears in long run due to increase in supply. The quasi-rent is a surplus that a producer receives in the short period over variable costs from the sale of output.

Distinction between "Rent" and "Quasi-Rent"

Sl. No.	*Rent*	*Quasi-Rent*
1.	Rent accrues to land	Quasi-Rent accrues to manmade appliances.
2.	The supply of land is fixed forever.	The supply of manmade appliances is fixed for a short period only.
3.	It enters into price	It does not enter into price.

QR= Total Revenue – Total Variable Cost

"Quasi-Rent is the income derived from machines and other appliances made by man".

-Alfred Marshall

6.5.4 The Modern Theory of Rent / Demand & Supply Theory of Rent

The classical economists' thought that land as a factor of production was different from other factors of production. But modern economists thought that all the factors of production are alike and there is no basic difference between them. Hence, a special theory for rent, developed by Ricardo is not necessary. Therefore, economists like Mrs.Joan Robinson and E.Boulding have contributed their ideas for the determination of rent, which is known as the "Modern Theory of Rent".

"The essence of the conception of rent is the conception of surplus earned by a particular part of a factor of production over and above the minimum earnings that is necessary to induce it to do work"

- Mrs.Joan Robinson

Rent is the difference between the actual earnings of a factor of production and its transfer earning.

Rent = Actual earning – Transfer earning.

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The minimum payment that has to be made to a particular factor of production to retain it in its present use is known as transfer earnings.

6.6 Wages



Wages are a payment for the services of labour, whether intellectual or physical. Wage may be paid daily, weekly, fortnightly, monthly or yearly and partly at the end of the year in the form of bonus.

6.6.1. Meaning

Wage is the price paid to the labourer for the services rendered .

> "A sum of money paid under contract by an employer to a worker for the services rendered".
>
> *-Benham*

6.6.2 Kinds of Wages

Wages are divided into four types:

1. **Nominal Wages or Money Wages.**

   Nominal wages are referred to the wages paid in terms of money.

2. **Real Wages**

   Real wages are the wages paid in terms of goods and services. Hence, real wages are the purchasing power of money wages.

3. **Piece Wages**

   Wages that are paid on the basis of quantum of work done.

4. **Time Wages**

   Wages that are paid on the basis of the amount of time that the worker works.

6.7 Theories of Wages

6.7.1 Subsistence Theory of Wages

Subsistence theory is one of the oldest theories of wages. It was first explained by Physiocrats, a group of French economists , it was restated by Ricardo.

According to this theory, wage must be equal to the subsistence level of the labourer and his family. Subsistence means the minimum amount of food, clothing and shelter which workers and their family require for existence.

If workers are paid higher wages than the subsistence level, the workers would be better off and they will have large families. Hence, the population would increase. When the population increases, the supply of labourer would increase and therefore, wages will come down.

On the other hand, if wages are lower than the subsistence level, there would be a reduction in population and thereby the supply of labour falls and wages increase

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to the subsistence level. So this theory is closely associated with Malthusian Theory of Population. This theory holds that the wages of workers would not be above or below the subsistence level of the labourer and his family.

Criticism

1. Role of trade unions in collective bargainings was not found.
2. It does not explain the differences in wages in different occupations.
3. The assumption that population would increase with a rise in wage rate is not correct. Poor families (and countries) have more Children than rich families (countries).Actually, as wage rate increases, people can afford to downsize their family size adopting by costly family planning procedures; while poor people cannot do so.

6.7.2 Standard of Living Theory of Wages

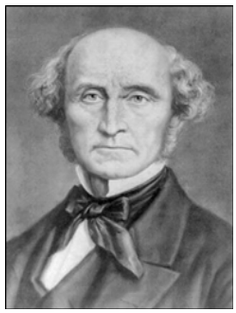
The Standard of Living Theory of Wages developed by Torrance is an improved and refined version of the Subsistence Theory of Wage. According to this theory, wage is equal to the standard of living of the workers. If standard of living is high, wages will be high and vice versa.

Standard of living wage means the amount necessary to maintain the labourer in a certain the standard of living to which he is accustomed.

Criticism

1. According to this theory, the standard of living determines wages. But in actual practice, wages determine the standard of living.

6.7.3 Wage Fund Theory of Wages



This theory was first propounded by Adam Smith. But the credit goes to J.S.Mill who perfected this theory

According to Mill "every employer will keep a given amount of capital for payment to the workers". It is known as "Wage Fund". It is fixed and constant. Wages depend directly upon the fund and inversely with number of labourers employed. The average wage of a worker can be calculated by using the formula.

$$\text{Average wage per worker} = \frac{\text{Total Wage Fund}}{\text{Number of Workers}}$$

If the number of workers increases, the wage per worker would fall and vice versa.

Criticism

1. It does not explain the difference in wages in different occupations.
2. It ignores the role of trade unions.
3. Actually the capitalists will take away a large sum before making payment of wages.
4. The theory fails to mention the amount of wage fund.

6.7.4 Residual Claimant Theory of Wage

This theory was propounded by the American economist F.A.Walkar in 1875,

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in his book Political Economy. According to this theory, wage is the residual portion after paying the remuneration of all the other three factors, namely, land, capital and organization.

Criticisms

1. This theory does not explain the role of trade unions which can secure higher wage for workers.
2. Demand side of labour in the determination of wages needs to be considered.

6.7.5 Marginal Productivity Theory of Wages

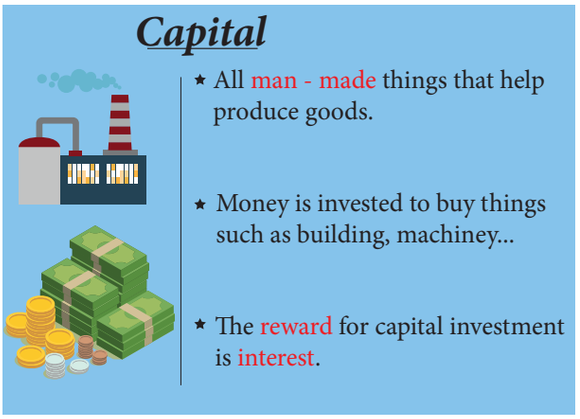
The application of general theory of distribution to wage fixation is the marginal productivity theory of wages.

According to this theory, wages are determined by the marginal productivity of labour and equal to it at the point of equilibrium.

Under perfect competition in the labour market wage is paid equal to marginal product of labour (wage = MP_L) But in real world where there is imperfect competition, there is exploitation of labour and wage is less than MP_L.

6.8 Interest

Generally speaking, interest is a payment made by a borrower to the lender for the money borrowed.



6.8.1 Meaning

Interest is the reward paid by the borrower to the lender for the use of capital.

> "Interest is the price paid for the use of capital in any market"
>
> *-ALFRED MARSHALL*

6.8.2 Kinds of Interest

Gross Interest

Gross interest is the total interest amount received by creditors from debtors.

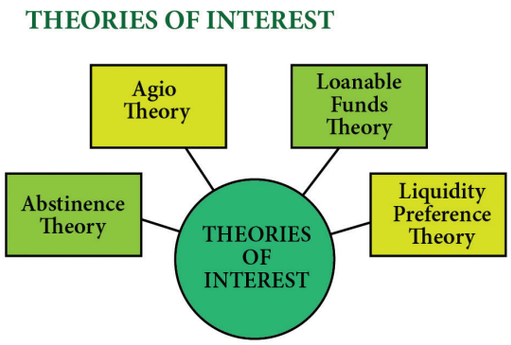
Gross Interest = (Net Interest) + (reward for inconvenience) + (insurance against risk of non-repayment) + (payment for service of debt management)

Net Interest

Net Interest is only a part of the gross interest. It is the payment for use of capital only. A good example for net interest is the interest payable for Government Securities.

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6.9 Theories of Interest



6.9.1 Abstinence Theory or Waiting Theory

This theory was propounded by N.W.Senior. To him, interest is the reward for abstaining from the immediate consumption of wealth. According to Senior, capital is the result of saving. But saving involves **"abstinence" or "sacrifice".** It is possible to save only if one abstains from present consumption. Such abstinence from present consumption involves some suffering. Hence, it is necessary to reward the saver (capitalist) to compensate for the sacrifice he has to undergo by abstaining from present consumption. Therefore, interest is the reward or compensation paid to the saver (capitalist) for his "abstinence" or "sacrifice".

Marshall accepted the Abstinence Theory of interest. But he used the word 'waiting' instead of "abstinence". Saving implies waiting. According to him, interest is the reward for waiting. Saving involves waiting. But people do not like to wait. So, in order to make them wait and in turn to save, we have to pay them some reward. Therefore, interest is the reward paid to the saver (capitalist) for his "waiting".

Criticism

According to this theory, saving involves suffering. But savings may not always involve suffering to some rich people. Rich people have money for which they do not get interest. Hoarding of money is to quench the thirst for liquidity.

6.9.2 Agio Theory of Interest/ The Psychological Theory of Interest/Time Preference Theory

This theory was propounded by John Rae in 1834. But credit goes to Bohm Bawerk an Austrian School economist who has given final shape to the theory. The American economist Irving Fisher modified and gave a new theory viz Time Preference theory.

According to this theory, people prefer present goods rather than future goods. Because the present goods are more certain than future goods, just **"as a bird in the hand is worth two in the bush"**. There are many countries where no one knows what will happen next day.ASEAN crisis of 1996 and American crisis of 2007-08 were not predicted even by economists, including Nobel Laureats. So, when people save they have to postpone their present enjoyment or satisfaction. If one postpones one's present satisfaction, one has to be paid an **"Agio" or "Premium"**. This premium is "interest". People prefer present consumption than future consumption due to the risk increasing and uncertainties of the present world.

6.9.3 Loanable Funds Theory/ The Neo Classical Theory

The Loanable Funds Theory, also known as the "Neo–Classical Theory", was

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developed by Swedish economists like Wicksell, Bertil Ohlin, Viner, Gunnar Myrdal and others.

According to this theory, interest is the price paid for the use of loanable funds. The rate of interest is determined by the equilibrium between demand for and supply of loanable funds in the credit market.

Demand for Loanable Funds

The demand for loanable funds depends upon the following:

1. **Demand for Investment (I)**

   The most important factor responsible for the loanable funds is the demand for investment. Bulk of the demand for loanable funds comes from business firms which borrow money for purchasing capital goods.

2. **Demand for Consumption (C)**

   The demand for loanable funds comes from individuals who borrow money for consumption purposes also.

3. **Demand for Hoarding (H)**

   The next demand for loanable funds comes from hoarders. Demand for hoarding money arises because of people's preference for liquidity, idle cash balances and so on. The demand for C, I and H varies inversely with interest rate.

Supply of Loanable Funds

The supply of loanable funds depends upon the following four sources:

1. **Savings (S)**

   Loanable funds come from savings.

   According to this theory, savings may be of two types, namely,

   1. Savings planned by individuals are called "ex-ante savings". E.g. LIC premium, EMI payment etc.
   2. The unplanned savings are called, "ex-post savings". Savings is left out after spending are ex post saving.

2. **Bank Credit (BC)**

   The bank credit is another source of loanable funds. Commercial banks create credit and supply loanable funds to the investors.

3. **Dishoarding (DH)**

   Dishoarding means bringing out the hoarded money into use and thus it constitutes a source of supply of loanable funds. In India,after 1991,Public sector undertakings are being sold to private people to mobilize more funds.This is also called Dishoarding.

4. **Disinvestment(DI)**

   Disinvestment is the opposite of investment.Inotherwordsdisinvestment means not providing sufficient funds for depreciation of equipment. It gives rise to the supply of loanable funds.

   All the four sources of supply of loanable funds vary directly with the interest rate.

Classical theory of Interest

The equilibrium interest rate, according to classical theory, is determined by the intersection of demand and supply curves, Demand for money refers to investment. Supply of money refers to savings S=I.

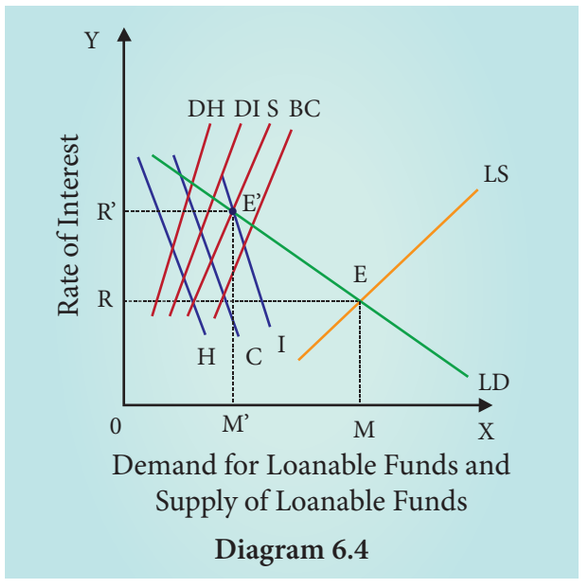
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Equilibrium

The rate of interest is determined by the equilibrium between the total demand for and the total supply of loanable funds.

Supply of and Demand for Loanable Funds

Supply of loanable funds	=	Savings + Bank Credit + Dishoarding + Disinvestment
		= S + BC + DH + DI
Demand for loanable funds	=	Investment + Consumption + Hoarding
		= I + C + H



Demand for Loanable Funds and Supply of Loanable Funds

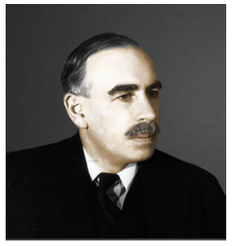
Diagram 6.4

In Diagram 6.4, X axis represents the demand for and supply of loanable funds and Y axis represents the rate of interest. The LS curve represents the total supply curve of loanable funds. This is obtained by the summation of the Saving Curve (S), Bank credit curve (BC), Dishoarding curve (DH) and Disinvestment curve (DI). The LD curve represents the total demand for loanable funds; this is obtained by the summation of the demand for investment curve I, demand curve for consumption demand or dissaving curve and curve for demand for hoarding curve H. The LD and LS curves, intersect each other at the point "E" the equilibrium point. At this point, OR rate of interest and OM is the amount of loanable funds.

Criticism

1. Many factors have been included in this theory.Still ther are many more factors.Two such factors are 1)Asymmetric Information and 2) Moral Hazard.In practice larger firms, due to their political powers, are able to get huge bank credit at lower interest rates.But due to NPAs, (Non-Performing Assets) small firms and depositors lose their interest income. The loanable funds theory is "indeterminate"" unless the income level is already known. (This can be studied in 12th standard Economics Book)
2. It is very difficult to combine real factors like savings and investment with monetary factors like bank credit and liquidity preference.

6.9.4 Keynes' Liquidity Preference Theory of Interest or The Monetary Theory of Interest



J.M. Keynes

Keynes propounded the Liquidity Preference Theory of Interest in his famous book, "The General Theory of Employment, Interest and Money" in 1936.

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According to Keynes, interest is purely a monetary phenomenon because the rate of interest is calculated in terms of money. To him, "interest is the reward for parting with liquidity for a specified period of time".

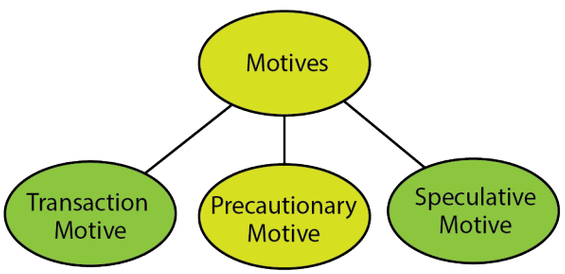
Meaning of Liquidity Preference

Liquidity preference means the preference of the people to hold wealth in the form of liquid cash rather than in other non-liquid assets like bonds, securities, bills of exchange, land, building, gold etc.

> "Liquidity Preference is the preference to have an amount of cash rather than of claims against others".
>
> ***- Meyer***

Motives of Demand for Money

According to Keynes, there are three



motives for liquidity preference. They are:

1. The Transaction Motive

The transaction motive relates to the desire of the people to hold cash for the current transactions (or day–to-day expenses).

The amount saved under this motive depends on the level of income. M_t and Y are positively associated. (Say M_t = 0.125Y; that means if income is ₹ 1000, demand for transaction motive is ₹ 125)

$$M_t = f(y)$$

2. The Precautionary Motive

The precautionary motive relates to the desire of the people to hold cash to meet unexpected or unforeseen expenditures such as sickness, accidents, fire and theft. The amount saved for this motive also depends on the level of income. (Say M_p = 0.125Y; it means if income is ₹ 1000, demand for M_p is ₹ 125)

$$M_p = f(y)$$

3. The Speculative Motive

The speculative motive relates to the desire of the people to hold cash in order to take advantage of market movements regarding the future changes in the price of bonds and securities in the capital market. The amount saved for this motive depends on the rate of interest. Ms = f (i). There is inverse relation between liquidity preference and rate of interest (Say M_s ie 125+125 = 450-100i).

Determination of Rate of Interest

According to Keynes, the rate of interest is determined by the demand for money and the supply of money. The demand for money is liquidity preference. In fact,

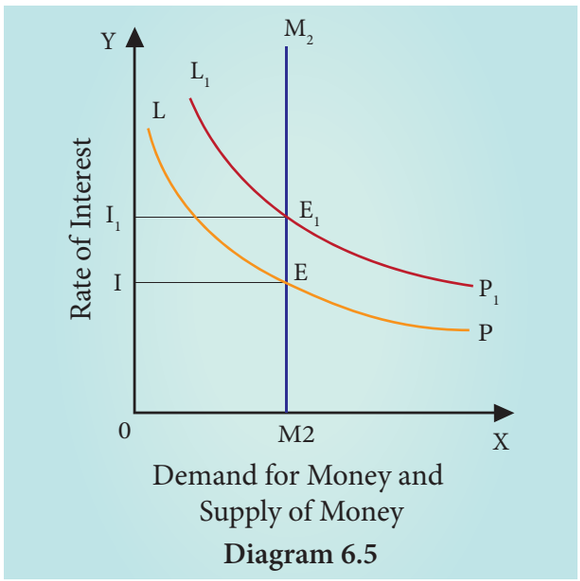
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liquidity preference for speculative motive determines rate of interest. The supply of money is determined by the policies of the Government and the Central Bank of a country. The total supply of money consists of coins, currency notes and bank deposits (Say M = 200).

Equilibrium between Demand and Supply of Money

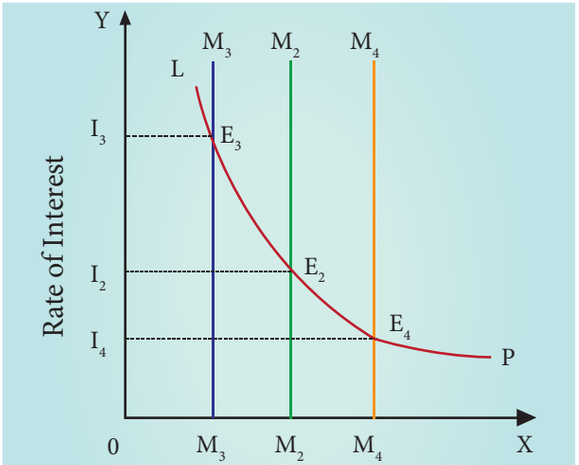
The equilibrium between liquidity preference and demand for money determines the rate of interest. In short-run, the supply of money is assumed to be constant (₹ 200).

In the diagram (6.5) LP is the liquidity preference Curve (demand curve). M_2 M_2 shows the supply curve of money to satisfy speculative motive. Both curves intersect at the point E, which is the equilibrium point. Hence, the rate of interest is I. If liquidity preference increases from LP to L_1P_1 the supply of money remains constant, the rate of interest would increase from OI to OI_1. Numerical examples given above can also be used for better understanding. Total demand for money=$M_t+M_p+M_s$



Demand for Money and Supply of Money

Diagram 6.5



Demand for Money and Supply of Money

Diagram 6.6

=0.125Y+0.125Y+(450-100i). Total supply of money=₹ -200. M_t and M_p are influenced by Y. Hence for the sake of easy understanding, Ms alone can be considered Demand for money=supply of money at equilibrium point:450-100i=200;450-200=100i;250=100i; i=250/100=2.5.This is equilibrium interest In reality, interest rate is also influenced by national income and commodity sector equilibrium.However, they are not included here for making the understanding easier.

In the diagram (6.6) Suppose LP remains constant. If the supply of money is OM_2, the interest is OI_2 and if the supply of money is reduced from OM_2 to OM_3, the interest would increase from OI_2 to OI_3. If the supply of money is increased from OM_2 to OM_4, the interest would decrease from OI_2 to OI_4.

Criticism

1. This theory does not explain the existence of different interest rates prevailing in the market at the same time.
2. It explains interest rate only in the short-run.

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6.10 Profit

The entrepreneur coordinates all the other three factors (land, labour and capital) of production. Entrepreneur is rewarded for his services in the form of profit.

6.10.1 Meaning of Profit

Profit is a return to the entrepreneur for the use of his entrepreneurial ability. It is the net income of the organizer. In other words, profit is the amount left with the entrepreneur after he has payments made for all the other factors (land, labour and capital) used by him in the production process. However, there are other versions also.

6.10.2 Kinds of Profit

I. Monopoly Profit: Profit earned by the firm because of its monopoly control.

II. Windfall Profit: Some times, profit arises due to sudden changes in price level. Profit is due to unforeseen factors.

III. Profit as functional reward: Just like rent, wage and interest, profit is earned by the entrepreneur for his entrepreneurial function.

6.10.3. Concepts of Profit

a. Gross Profit

Gross Profit is the surplus which accrues to a firm when it subtracts its Total Expenditure from its Total Revenue.

Gross Profit = Total Revenue- Total cost

Here cost implies explicit costs only (Normally economic cost, social cost and environmental cost are not considered by the Accountants in India).

b. Net Profit or Pure Profit or Economic profit or True profit

Net or pure or economic or true profit is the residual left with entrepreneur after deducting from Gross profit the remuneration for the self-owned factors of production, which are called implicit cost.

Net Profit = Gross Profit- Implicit costs

c. Normal Profit

It refers to the minimum expected return to stay in business.

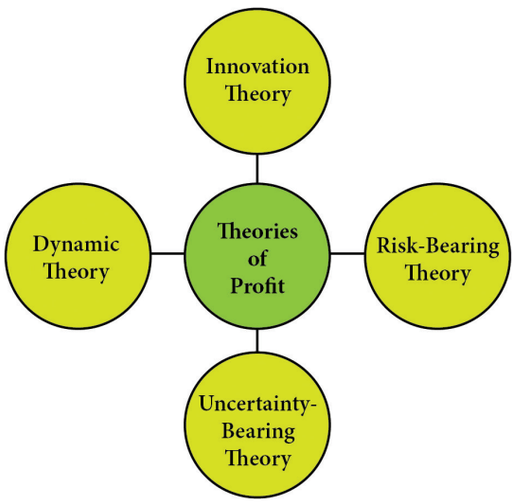
d. Super Normal Profit

Super normal profits are over and above the normal profit.

Super Normal Profit = Actual profit- Normal profit

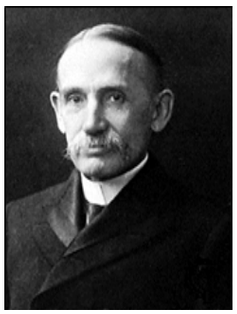
6.11 Theories of Profit

THEORIES OF PROFIT



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6.11.1 Dynamic Theory of Profit



This theory was propounded by the American economist J.B.Clark in 1900. To him, profit is the difference between price and cost of production of the commodity. Hence, profit is the reward for dynamic changes in society. Further he points out that, profit cannot arise in a static society. Static society is one where everything is stationary or stagnant and there is no change at all. Therefore, there is no role for an entrepreneur in a static society. The price of the commodities in a static society would be equal to their cost of production. So, there would be no profit for the entrepreneur. The entrepreneur only gets wages for management and interest on his capital.

At present several changes are taking place in a dynamic society. Changes are permanent. According to Clark, the following five main changes are taking place in a dynamic society.

1. Population is increasing
2. Volume of Capital is increasing.
3. Methods of production are improving.
4. Forms of industrial organization are changing.
5. The wants of consumer are multiplying.

6.11.2 Innovations Theory of Profit

Innovations theory of profit was propounded by Joesph. A.Schumpeter. To Schumpeter, an entrepreneur is not only an undertaker of a business, but also an innovator in the process of production. To him, profit is the reward for "innovation". Innovation means invention put into commercial practice.

According to Schumpeter, an innovation may consist of the following:

1. Introduction of a new product.
2. Introduction of a new method of production.
3. Opening up of a new market.
4. Discovery of new raw materials
5. Reorganization of an industry / firm.

When any one of these innovations is introduced by an entrepreneur, it leads to reduction in the cost of production and thereby brings profit to an entrepreneur. To obtain profit continuously, the innovator needs to innovate continuously. The real innovators do so. Imitative entrepreneurs cannot innovate.

6.11.3 Risk Bearing Theory of Profit

Risk bearing theory of profit was propounded by the American economist F.B.Hawley in 1907. According to him, profit is the reward for "risk taking" in business. Risk taking is an essential function of the entrepreneur and is the basis of profit. It is a well known fact that every business involves some risks.

Since the entrepreneur undertakes the risks, he receives profits. If the entrepreneur does not receive the reward, he will not be prepared to undertake the risks. Thus, higher the risks, the greater are the profit.

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Every entrepreneur produces goods in anticipation of demand. If his anticipation of demand is correct, then there will be profit and if it is incorrect, there will be loss. It is the profit that induces the entrepreneurs to undertake such risks.

6.11.4 Uncertainty Bearing Theory of Profit

Uncertainty theory was propounded by the American economist Frank H.Knight. To him, profit is the reward for "uncertainty bearing". He distinguishes between "insurable" and "non-insurable" risks.

Insurable Risks

Certain risks are measurable or calculable. Some of the examples of these risks are the risk of fire, theft and natural disasters. Hence, they are insurable. Such risks are compensated by the Insurance Companies.

Non-Insurable Risks

There are some risks which are immeasurable or incalculable. The probability of their occurrence cannot be anticipated because of the presence of uncertainty in them. Some of the examples of these risks are competition, market condition, technology change and public policy. No Insurance Company can undertake these risks. Hence, they are non-insurable. The term "risks" covers the first type of events (measurables - insurable) and the term "uncertainty" covers the second type of events (unforeseeable or incalculatable or not measurable or non-insurable).

According to Knight, profit does not arise on account of risk taking, because the entrepreneur can guard himself against a risk by taking a suitable insurance policy. But uncertain events cannot be guarded against in that way. When an entrepreneur takes himself the burden of facing an uncertain event, he secures remuneration. That remuneration is "profit".

6.12 Conclusion

In this chapter, the determination of how the prices of various factors of production (namely land, labour, capital, and organization) has been discussed. In short, all the theories are related to factors of pricing, factors of production. However,it needs to be understood that no theory can completely comprehend every thing.The reality will always be more complicated than what the theories could predict or perceive.Theories are only guide lines,they cannot predict with 100% perfection.However,the scientific studies attempt to enhance the degree of perfection.

GLOSSARY

1. **Distribution** – Distribution of wealth among agents or the owners of the factors of production.
2. **Rent** – Rent is reward for the use of land.

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3. **Wages** – Wages are the reward for labour.
4. **Interest** – Interest is the price paid for the use of capital.
5. **Profit** – Profit is the reward for organisation or entrepreneurship.
6. **Quasi-Rent** – Quasi-Rent is the surplus earned by man-made appliances and instruments of production in the short-period.
7. **Transfer earnings** – Transfer earnings refer to minimum payment payable to a factor to retain it in its present use.
8. **Money wage** – Money wage is the remuneration received by a labourer in terms of money.
9. **Real wage** – Real wage is the purchasing power of the money wages in terms of goods and services.
10. **Loanable fund** – Loanable fund is that part of capital meant for loan.
11. **Innovation** – Invention put into commercial practice.

MODEL QUESTIONS

SN2A6

PART – A

1. In Economics, distribution of income is among the
   a. factors of production
   b. individual
   c. firms
   d. traders
2. Theory of distribution is popularly known as,
   a. Theory of product-pricing
   b. Theory of factor-pricing
   c. Theory of wages
   d. Theory of Interest
3. Rent is the reward for the use of
   a. capital
   b. labour
   c. land
   d. organization
4. The concept of 'Quasi-Rent' is associated with
   a. Ricardo
   b. Keynes
   c. Walker
   d. Marshall

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5. The Classical Theory of Rent was propounded by

   a. Ricardo

   b. Keynes

   c. Marshall

   d. Walker

6. 'Original and indestructible powers of the soil' is the term used by

   a. J.S.Mill

   b. Walker

   c. Clark

   d. Ricardo

7. The reward for labour is

   a. rent

   b. wage

   c. profit

   d. interest

8. Money wages are also known as

   a. real wages

   b. nominal wages

   c. original wages

   d. transfer wages

9. Residual Claimant Theory is propounded by

   a. Keynes

   b. Walker

   c. Hawley

   d. Knight

10. The reward given for the use of capital

    a. rent

    b. wage

    c. interest

    d. profit

11. Keynesian Theory of interest is popularly known as

    a. Abstinence Theory

    b. Liquidity Preference Theory

    c. Loanable Funds Theory

    d. Agio Theory

12. According to the Loanable Funds Theory, supply of loanable funds is equal to

    a. S + BC + DH + DI

    b. I + DS + DH + BM

    c. S + DS + BM + DI

    d. S + BM + DH + DS

13. The concept of meeting unexpected expenditure according to Keynes is

    a. Transaction motive

    b. Precautionary motive

    c. Speculative motive

    d. Personal motive

14. The distribution of income or wealth of a country among the individuals are

    a. functional distribution

    b. personal distribution

    c. goods distribution

    d. services distribution

15. Profit is the reward for

    a. land

    b. organization

    c. capital

    d. labour

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16. Innovation Theory of profit was given by

a. Hawley

b. Schumpeter

c. Keynes

d. Knight

17. Quasi-rent arises in

a. Man-made appliances

b. Homemade items

c. Imported items

d. None of these

18. "Wages as a sum of money are paid under contract by an employer to a worker for services rendered" –Who said this?

a. Benham

b. Marshall

c. Walker

d. J.S.Mill

19. Abstinence Theory of Interest was propounded by

a. Alfred Marshall

b. N.W Senior

c. Bohm-Bawerk

d. Knut Wicksell

20. Loanable Funds Theory of Interest is called

a. Classical Theory

b. Modern Theory

c. Traditional Theory

d. Neo-Classical Theory

Part- A Answers

1	2	3	4	5	6	7	8	9	10
a	b	c	d	a	d	b	b	b	c
11	12	13	14	15	16	17	18	19	20
b	a	b	b	b	b	a	a	b	d

PART – B Answer the following questions in one or two sentences.

21. What is meant by distribution?

22. Mention the types of distribution.

23. Define 'Rent'.

24. Distinguish between real and money wages.

25. What do you mean by interest?

26. What is profit?

27. State the meaning of liquidity preference.

Part-C Answer the Following Questions in a Paragraph

28. What are the motives of demand for money?

29. List out the kinds of wages.

30. Distinguish between rent and quasi-rent.

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31. Briefly explain the Subsistence Theory of Wages.

32. State Waiting Theory of Interest.

33. Describe briefly the Innovation Theory of Profit.

34. Write a note on Risk-bearing Theory of Profit.

PART – D Answer the Following Questions in One Page

35. Explain the Marginal Productivity Theory of Distribution.

36. Illustrate the Ricardian Theory of Rent.

37. Elucidate the Loanable Funds Theory of Interest.

38. Explain the Keynesian Theory of Interest.

ACTIVITY

Visit any manufacturing unit (factory) and collect information about factors of production (land, labour, capital and organisation) and compare their remunerations.

Students may be asked to meet the stakeholders in the factory.

- Entrepreneur.
- Manager or Managing Director.
- Employees.

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CHAPTER

7 Indian Economy





"India will be a global player in the digital economy"

–Sunder Pichai, CEO Google

Learning Objectives

1. To understand the current status of the Indian Economy in terms of features, Natural resources, infrastructure facilities and so on.
2. To understand the contributions of major Indian Economic Thinkers.

7.1 Meaning of Growth and Development

A country's economic growth is usually measured by National Income, indicated by **Gross Domestic Product (GDP)**. The GDP is the total monetary value of the goods and services produced by that country over a specific period of time, usually one year.

The level of economic development is indicated not just by GDP, but by an increase in citizens' quality of life or well-being. The quality of life is being assessed by several indices such as Human Development Index (HDI), Physical Quality of Life Index (PQLI) and Gross National Happiness Index (GNHI).

Gross National Happiness Index (GNHI)

The term "Gross National Happiness" was coined by the fourth king of Bhutan, Jigme Singye Wangchuck, in 1972. It is an indicator of progress, which measures sustainable development, environmental conservation promotion of culture and good governance.

On the basis of the level of economic development, nations are classified as developed and developing economies.

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Developed economies are those industrialised, countries which utilise their resources efficiently and have high per capita income. The USA, Canada, U.K, France, and Japan are some of the developed economies. Developed economies are also termed as Advanced Countries. On the other hand, countries which have not fully utilized their resources like land, mines, workers, etc., and have low per capita income are termed as under developed economies. Examples of underdeveloped countries are Sub Saharan Africa, BanglaDesh, Myanmar, Pakistan, Indonesia etc.They are also termed as Under developed Countries or Backward Nations or Third World Nations.

Features of a Developed Economy

1) High National Income
2) High Per Capita Income
3) High Standard of Living
4) Full Employment of Resources
5) Dominance of Industrial Sector
6) High Level of Technology
7) High Industrialisation
8) High ConsumptionLevel
9) High Level of Urbanisation
10) Smooth Economic Growth
11) Social Equity, Gender Equality and Low Levels of Poverty
12) Political Stability and Good Governance

7.2 Indian Economy

GDP Growth Rate

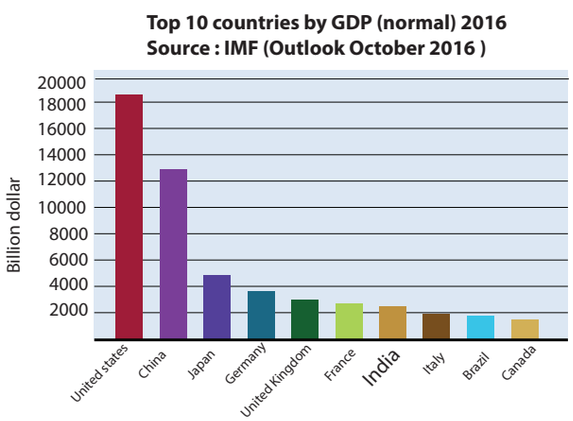


Diagram 7.1

Indian economy is the Seventh largest economy of the world. Being one of the top listed countries. In terms of industrialization and economic growth, India holds a robust position with an average growth rate of 7% (approximately).

Even though the rate of growth has been sustainable and comparatively stable, there are still signs of backwardness.

7.3 Features of Indian Economy

7.3.1 Strengths of Indian Economy

1. *India has a mixed economy*

Indian economy is a typical example of mixed economy. This means both private and public sectors co-exist and function smoothly. On one side, some of the fundamental and heavy industrial units are being operated under the public sector,while, due to the liberalization of the economy, the private sector has gained

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importance. This makes it a perfect model for public – private partnership.

2. Agriculture plays the key role

Agriculture being the maximum pursued occupation in India, plays an important role in its economy as well. Around 60% of the people in India depend upon agriculture for their livelihood. In fact, about 17% of our GDP today is contributed by the agricultural sector. Green revolution, ever green revolution and inventions in bio technology have made agriculture self sufficient and also surplus producing. The export of agricultural products such as fruits, vegetables, spices, vegetable oils, tobacco, animal skin, etc. also add to forex earning through international trading.

3. An emerging market

India has emerged as a vibrant economy sustaining stable GDP growth rate even in the midst of global downtrend. This has attracted significant foreign capital through FDI and FII.India has a high potential for prospective growth. This also makes it an emerging market for the world.

4. Emerging Economy



Emerging as a top economic giant among the world economy, India bags the ***seventh*** position in terms of nominal *Gross Domestic Product (GDP)* and ***third*** in terms of *Purchasing Power Parity (PPP)*. As a result of rapid economic growth Indian economy has a place among the G20 countries.

5. Fast Growing Economy

India's economy is well known for high and sustained growth. It has emerged as the world's fastest growing economy in the year 2016-17 with the growth rate of 7.1% in GDP next to People's Republic of China.

6. Fast growing Service Sector

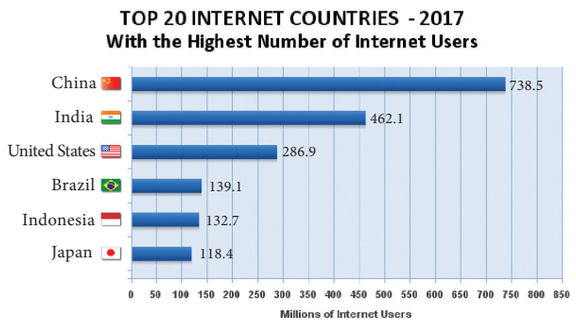


Diagram 7.2

The service sector, contributes a lion's share of the GDP in India. There has been a high rise growth in the technical sectors like Information Technology, BPO etc. These sectors have contributed to the growth of the economy. These emerging service sectors have helped the country go global and helped in spreading its branches around the world.

7. Large Domestic consumption

With the faster growth rate in the economy the standard of living has improved a lot.

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This in turn has resulted in rapid increase in domestic consumption in the country. The standard of living has considerably improved and life style has changed.

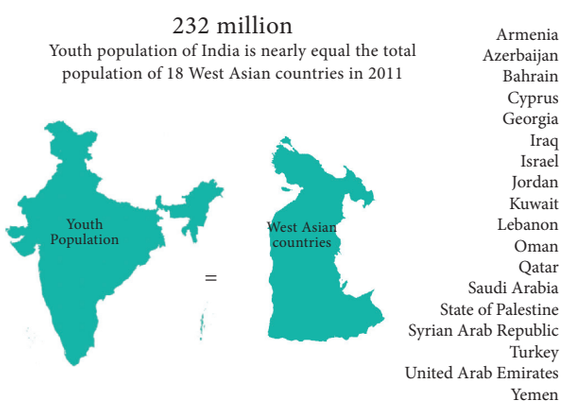
8. *Rapid growth of Urban areas*

Urbanization is a key ingredient of the growth of any economy. There has been a rapid growth of urban areas in India after independence. Improved connectivity in transport and communication, education and health have speeded up the pace of urbanization.

9. *Stable macro economy*

The Indian economy has been projected and considered as one of the most stable economies of the world. The current year's Economic survey represents the Indian economy to be a ***"haven of macroeconomic stability, resilience and optimism.*** According to the Economic Survey for the year 2014-15, 8%-plus GDP growth rate has been predicted, with actual growth turning out to be a little less (7.6%). This is a clear indication of a stable macroeconomic growth.

10. *Demographic dividend*



The human capital of India is young. This means that India is a pride owner of the maximum percentage of youth. The young population is not only motivated but skilled and trained enough to maximize the growth. Thus human capital plays a key role in maximizing the growth prospects in the country. Also, this has invited foreign investments to the country and outsourcing opportunities too.

7.3.2 Weakness of Indian Economy

1. *Large Population*

India stands second in terms of size of population next to China and our country is likely to overtake China in near future. Population growth rate of India is very high and this is always a hurdle to growth rate. The population growth rate in India is as high as 1.7 per 1000.The annual addition of population equals the total population of Australia.

2. *Inequality and poverty*

There exists a huge economic disparity in the Indian economy. The proportion of income and assets owned by top 10% of Indians goes on increasing. This has led to an increase in the poverty level in the society and still a higher percentage of individuals are living Below Poverty Line (BPL). As a result of unequal distribution, 'the rich become richer and the poor become poorer'.

3. *Increasing Prices of Essential Goods*

Even though there has been a constant growth in the GDP and growth

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opportunities in the Indian economy, there has been steady increase in the prices of essential goods. The continuous rise in prices erodes the purchasing power and adversely affects the poor people, whose income is not protected.

4. *Weak Infrastructure*

Even though there has been a gradual improvement in the infrastructural development in the past few decades, there is still a scarcity of the basic infrastructure like power, transport, storage etc.

5. *Inadequate Employment generation*

With growing youth population, there is a huge need for employment opportunities. The growth in production is not accompanied by creation of job. The growth in Indian economy is characterized by 'jobless growth'.

6. *Outdated technology*

The level of technology in agriculture and small scale industries is still outdated and obsolete.

7.3.3 Demographic trends in India

Scientific study of the characteristics of population is known as Demography. The various aspects **of demographic trends in India are:**

- Size of population
- Rate of growth
- Birth and death rates
- Density of population
- Sex-ratio
- Life-expectancy at birth
- Literacy ratio

a. Size of Population

Table 7.1 Population Growth

Census Year	Population (in crores)	Average annual growth rate
1901	23.84	-
1911	25.21	0.56
1921	25.13	-0.03
1931	27.90	1.04
1941	31.87	1.33
1951	36.11	1.25
1961	43.92	1.96
1971	54.81	2.20
1981	68.33	2.22
1991	84.33	2.16
2001	102.70	1.97
2011	121.02	1.66

(Source: Registrar General of India)

Over a period of 100 years, India has quadrupled its population size. In terms of, size of population, India ranks 2nd in the world after China. India has only about 2.4% of the world's geographical area and contributes less than 1.2% of the world's income, but accommodates about 17.5% of the world's population. In other words, every 6th person in the world is an Indian. Infact, the combined population of just two states namely, Uttar Pradesh and Maharashtra is more than the population of United States of America, the third most populous country of the world. Some of the states in India have larger population than many countries in the world.

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The negative growth during 1911-21 was due to rapid and frequent occurrence of epidemics like cholera, plague and influenza and also famines. The year 1921 is known as the '***Year of Great Divide***' for India's population as population starts increasing.

During 1951, population growth rate has come down from 1.33% to 1.25%. Hence it is known as '***Year of Small divide***'.

In 1961, population of India started increasing at the rate of 1.96% i.e, 2%. Hence 1961 is known as '***Year of Population Explosion***'. In the year 2001, the Population of India crossed one billion (100 crore) mark.

The 2011 census reveals growth of youth population which is described as 'demographic transition'.

b. Birth rate and death rate

Crude Birth rate: It refers to the number of births per thousand of population.

Crude Death rate: It refers to the number of deaths per thousand of population.

Crude birth and death rates of India during various years.

Table 7.2
Birth rate and death rate

Year	C.B.R	C.D.R.
1951	39.9	27.4
2001	25.4	8.4
2011	21.8	7.11

(Source: Registrar General of India)

Birth rate was 39.9 in 1951; it fell to 21.8 in 2011. Although the birth rate has declined, the decline is not so remarkable. The death rate has declined from 27.4 in 1951 to 7.1 in 2011. However, from the data it is clear that the fall in birth rates is less than that of death rates.

Kerala has the lowest birth rate (14.7) and Uttar Pradesh has the highest birth rate (29.5). West Bengal has the lowest death rate (6.3) and Orissa (9.2) has the highest. Among States, Bihar has the highest decadal (2001-11) growth rate of population, while Kerala has the lowest growth rate. The four states Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh called ***BIMARU*** states have very high population.

c. Density of population

It refers to the average number of persons residing per square kilometre area or land. It represents the man- land ratio. As the total land area remains the same, an increase in population causes density of population to rise.

$$\text{Density of population} = \frac{\text{Total population}}{\text{Land area of the region}}$$

Table 7.3 Density of population

Year	Density of population (No. of persons per sq. km)
1951	117
2001	325
2011	382

(Source: Registrar General of India)

Just before Independence, the density of population was less than 100. But after independence, it has increased rapidly from 117 in 1951 to 325 in 2001. According to 2011 census, the present Density of population is 382. Thus, the pressure of population on land has been rising. Kerala,

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West Bengal, Bihar and Uttar Pradesh have density higher than the India's average density. Bihar is the most densely populated state in the country with 1,102 persons living per sq.km followed by West Bengal with 880. Arunachal Pradesh has low density of population of only 17 persons.

d. Sex ratio

It refers to the number of females per 1,000 males. It is an important indicator to measure the extent of prevailing equity between males and females at a given point of time.

Table 7.4 Sex Ratio

Census year	Sex ratio (Number of females per 1000 males)
1951	946
2001	933
2011	940

(Source: Registrar General of India)

In India, the sex ratio is more favourable to males than to females. In Kerala, the adult sex ratio is 1084 as in 2011. The recent census (2011) shows that there has been a marginal increase in sex ratio. Haryana has the lowest sex ratio of 877 (2011) among other states, while Kerala provides better status to women as compared to other States with 1084 females per 1000 males

e. Life expectancy at birth

It refers to the mean expectation of life at birth. Life expectancy has improved over the years. Life expectancy is low when death rate is high and / or instances of early death are high. On the other hand, life expectancy is high when death rate is low and / or instances of early death are low.

Table 7.5 Life Expectancy (in Years)

Year	Male	Female	Overall
1951	32.5	31.7	32.1
1991	58.6	59.0	58.7
2001	61.6	63.3	62.5
2011	*62.6*	*64.2*	*63.5*

(Source: Registrar General of India)

During 1901 – 11, life expectancy was just 23 years. It increased to 63.5 years in 2011. A considerable fall in death rate is responsible for improvement in the life expectancy at birth. However the life expectancy in India is very low compared to that of developed countries.

f. Literacy ratio

It refers to the number of literates as a percentage of the total population. In 1951, only one-fourth of the males and one-twelfth of the females were literates. Thus, on an average, only one-sixth of the people of the country were literates. In 2011, 82% of males and 65.5% of females were literates giving an overall literacy rate of 74.04% (2011). When compared to other developed countries and even Sri Lanka this rate is very low.

Table 7.6 Literacy ratio

Census year	Literate persons %	Males%	Females%
1951	18.3	27.2	8.9
2001	64.8	75.3	53.7
2011	74.04	82.1	65.5

(Source: Registrar General of India)

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Kerala has the highest literacy ratio (94%), Mizoram (91.3%),followed by Goa (88.7%), Himachal Pradesh (82.8%), Maharastra (82.3%),Sikkim (81.4%), and Tamil Nadu (80.1%). Bihar has the lowest literacy ratio (61.8%) in 2011.

7.4 Natural Resources

Any stock or reserve that can be drawn from nature is a Natural Resource. The major natural resources are - land, forest, water, mineral and energy. India is rich in natural resources, but majority of the Indians are poor. Nature has provided India with diverse climate, several rivers for irrigation and power generation, rich minerals, rich forest and diverse soil.

Types of Natural resources

(a) Renewable Resources: Resources that can be regenerated in a given span of time. E.g. forests, wildlife, wind, biomass, tidal, hydro energies etc.

(b) Non-Renewable Resources: Resources that cannot be regenerated. E.g. Fossil fuels-coal, petroleum, minerals, etc.

7.4.1 Land Resources

In terms of area India ranks seventh in the world with a total area of 32.8 lakh sq. km. It accounts for 2.42% of total area of the world. In absolute terms India is really a big country. However, land- man ratio is not favourable because of the huge population size.

According to Agricultural Census, the area operated by large holdings (10 hectares and above) has declined and area operated under marginal holdings (less than one hectare) has increased. This indicates that land is being fragmented and has become uneconomic.

7.4.2 Forest Resources

India's forest cover in 2007 is 69.09 million hectare which constitutes 21.02 per cent of the total geographical area. Of this, 8.35 million hectare is very dense forest, 31.90 million hectare is moderately dense forest and the rest 28.84 million hectare is open forest.

7.4.3 Important Mineral Resources

a. Iron-Ore

India possesses high quality iron-ore in abundance. The total reserves of iron-ore in the country are about 14.630 million tonnes of haematite and 10,619 million tonnes of magnetite. Hematite iron is mainly found in Chattisgarh, Jharkhand, Odisha, Goa and Karnataka.The major deposit of magnetite iron is available at western coast of Karnataka. Some deposits of iron ore are also found in Kerala, Tamil Nadu and Andhra Pradesh.

b. Coal and Lignite

Coal is the largest available mineral resource. India ranks third in the world after China and USA in coal production. The main centres of coal in India are West Bengal, Bihar, Madhya Pradesh, Maharashtra,Odisha and Andhra Pradesh. Bulk of the coal production comes from Bengal-Jharkhand coalfields.

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c. Bauxite

Bauxite is a main source of metal like aluminium. Major reserves are concentrated in the East Coast bauxite deposits of Odisha and Andhra Pradesh.

d. Mica

Mica is a heat resisting mineral which is also a bad conductor of electricity. It is used in electrical equipments as an insulator. India stands first in sheet mica production and contributes 60% of mica trade in the world. The important mica bearing pegmatite is found in Andhra Pradesh, Jharkhand, Bihar and Rajasthan.

e. Crude Oil

Oil is being explored in India at many places of Assam and Gujarat. Digboi, Badarpur, Naharkatia, Kasimpur, Palliaria, Rudrapur, Shivsagar, Mourn (All in Assam) and Hay of Khambhat, Ankaleshwar and Kalol (All in Gujarat) are the important places of oil exploration in India.

f. Gold

India possesses only a limited gold reserve. There are only three main gold mine regions—Kolar Goldfield, Kolar district and Hutti Goldfield in Raichur district (both in Karnataka) and Ramgiri Goldfield in Anantpur district (Andhra Pradesh).

g. Diamond

As per UNECE (United Nations Economic Commission for Europe)the total reserves of diamond is estimated at around 4582, thousand carats which are mostly available in Panna(Madhya Pradesh),Rammallakota of Kurnur district of Andhra Pradesh and also in the Basin of Krishna River.The new Kimberlile fields have been discovered in Raipur and Pastar districts of Chattisgarh, Nuapada and Bargarh districts of Odisha, Narayanpet – Maddur Krishna areas of Andhra Pradesh and Raichur-Gulbarga districts of Karnataka.

7.5 Infrastructure

Infrastructural development means the development of many support facilities. These facilities may be divided into (a) economic infrastructure and (b) social infrastructure. Economic infrastructure includes - transport, communication, energy, irrigation, monetary and financial institutions. Social infrastructure includes - education, training and research, health, housing and civic amenities.

7.6 Economic Infrastructure

Economic infrastructure is the support system which helps in facilitating production and distribution. For instance, railways, trucks, posts and telegraph offices, ports, canals, power plants, banks, insurance companies etc. are all economic infrastructure of an economy. They help in the production of goods and services.

7.6.1 Transport

For the sustained economic growth of a country, a well-connected and efficient

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transport system is needed. India has a good network of rail, road, coastal shipping, and air transport. The total length of roads in India being over 30 lakh km, India has one of the largest road networks in the world. In terms of railroads, India has a broad network of railroad lines, the largest in Asia and the fourth largest in the world. The total rail route length is about 63,000 km and of this 13,000 km is electrified. The major Indian ports including Calcutta, Mumbai, Chennai, Vishakhapatnam and Goa handle about 90% of sea- borne trade and are visited by cargo carriers and passenger liners from all parts of the world. A comprehensive network of air routes connects the major cities and towns of the country. The domestic air services are being operated by Indian Airlines and private airlines. The international airport service is operated by Air India.

Indian Railways Provide Wi-Fi Facility First in India in Bangalore Railway Station

Air India and Indian Airlines were merged on August 27, 2007 to form National Aviation Company of India Ltd. (NACIL)

The National Harbour board was set up in1950 to advise the Central and State Governments on the management and development of ports, particularly minor ports

7.6.2 Energy

Electrical energy is one of the necessary components of our life. Nowadays, without electricity, we cannot survive in this world of technology. The energy sources are classified under two heads based on the availability of the raw materials used, while generating energy.

1. *Non-renewable energy sources*
2. *Renewable energy sources*

1. **Non-renewable energy sources**

   As the name suggests, the sources of energy which cannot be renewed or re-used are called non-renewable energy sources. Basically these are the energy sources which will get exhausted over a period of time. Some of the examples of this kind of resources are coal, oil, gas etc.

2. **Renewable energy sources**

   These are the kinds of energy source which can be renewed or reused again and again. These kinds of materials do not exhaust or literally speaking these are available in abundant or infinite quantity. Example for this kind include

   1. *Solar energy*
   2. *Wind energy*
   3. *Tidal energy*
   4. *Geothermal energy*
   5. *Biomass energy*

Sometimes renewable sources are also called non-conventional sources of energy since, these kinds of materials or these ways of energy production were not used earlier or conventionally.

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7.7 Social Infrastructure

Social infrastructure refers to those structures which are improving the quality of manpower and contribute indirectly towards the growth of an economy. These structures are outside the system of production and distribution. The development of these social structures help in increasing the efficiency and productivity of manpower. For example, schools, colleges, hospitals and other civic amenities. It is a fact that one of the reasons for the low productivity of Indian workers is the lack of development of social infrastructure. The status and developments in the social infrastructure in India are discussed below.

7.7.1 Education

a. Education in India

Imparting education on an organized basis dates back to the days of 'Gurukul' in India. Since then the Indian education system has flourished and developed with the growing needs of the economy. The Ministry of Human Resource Development (MHRD) in India formulates education policy in India and also undertakes education programs.

b. Education system in India

Education in India until 1976 was the responsibility of the State governments. It was then brought under concurrent list (both Centre and State). The Centre represented by the Ministry of Human Resource Development decides India's education budget.

The education system in India primarily consists of six levels:

- *Nursery Class*
- *Primary Class*
- *Secondary Level*
- *Higher Secondary Level*
- *Graduation*
- *Post-Graduation*

c. Education Institutions in India:

Education in India follows the 10+2 pattern. For higher education, there are various State run as well as private institutions and universities providing a variety of courses and subjects. The accreditation of the universities is decided under the University Grants Commission Act. The Education Department consists of various schools, colleges and universities imparting education on fair means for all sections of the society. The budget share of the education sector is around 3% of GDP largest proportion of this goes for school education. However, per pupil expenditure is the lowest for school students.

7.7.2 Health

a. Health in India

Health in India is a state government responsibility. The Central Council Of Health and Welfare formulates the various health care projects and health department reform policies. The administration of health industry in India as well as the technical needs of the health sector are the responsibility of the Ministry Of Health And Welfare.

Health care in India has many forms. These are the Siddha medicine, Ayurvedic

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medicine practice, Unani or Galenic herbal care, Homeopathy, Allopathy, Yoga, and many more. Each different healthcare form has its own treatment system and practice patterns. The medical practicing in India needs a proper licensing from the Ministry of Health. All medical systems are now under one ministry viz AYUSH.

b. Health Care Services in India:

The health care services in India are mainly the responsibility of the Ministry of Health. State wise, health status is better in Kerala as compared to other States. Compared to other developed countries, India's health status is not satisfactory. India's health status is poor compared to Sri Lanka.

7.8 Contributions of Indian Economic Thinkers

7.8.1 Thiruvalluvar



The economic ideas of Thiruvalluvar are found in his immortal work, Thirukkural, a book of ethics. Even though scholars differ widely over the estimation of the period of Thiruvalluvar, it is generally believed that, he belongs to the Sangam age in Tamil Nadu around third century A.D. Thiruvalluvar's work is marked by pragmatic idealism.

A large part of Thiruvalluvar's economic ideas are found in the second part of Thirukkural, the porutpal. It deals with wealth. Thiruvalluvar is a fundamental thinker. He believes that rains are the basic support for life. Since rain provides food, it forms the basis for stable economic life. Agriculture which is the most fundamental economic activity depends on rain,"It is rain that both ruins and aids the ruined to rise".

a. Factors of Production

Thiruvalluvar has made many passing references about the factors of production viz., Land, Labour, Capital, Organisation, Time, Technology etc. He says, "Unfailing harvest, competent body of men, group of men, whose wealth knows no diminution, are the components of an economy".(Kural 61)

b. Agriculture

According to Thiruvalluvar, agriculture is the most fundamental economic activity. They are the linch -pin of the world, for on their prosperity revolves prosperity of other sectors of the economy, "The ploughmen alone", he says *"live as the freemen of the soil; the rest are mere slaves that follow on their toil"*(Kural 1032). Thiruvalluvar believes that agriculture is superior to all other occupations.

c. Public Finance

Thiruvalluvar has elaborately explained Public Finance under the headings Public Revenue, Financial Administration and Public expenditure. He has stated these as 1) Creation of revenue, 2) Collection of revenue, 3) Management of revenue 4) Public expenditure

d. Public Expenditure

Thiruvalluvar has recommended a balanced budget. *" It is not a great misfortune for a state if its revenues are limited, provided the expenditure is kept within bounds."* He has given certain guidelines for a budgetary policy.

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"*Budget for a surplus, if possible, balances the budget at other times, but never budget for a deficit.*" Thiruvalluvar advocates the following main items of public expenditure: 1) Defence 2) Public Works and 3) Social Services.

e. External Assistance

Thiruvalluvar was against seeking external assistance. According to Kural No. 739, countries taking external assistance are not to be considered as countries at all. In other words, he advocated a self-sufficient economy.

f. Poverty and Begging

Thiruvalluvar considers freedom from hunger as one of the fundamental freedoms that should be enjoyed by every citizen. According to him 'poverty' is the root cause of all other evils which would lead to ever-lasting sufferings. It is to be noted that the number of people living below poverty line, begging, sleeping on the roadsides and rag picking in India has been increasing.

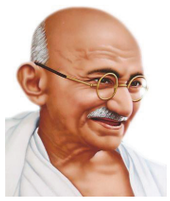
g. Wealth

Thiruvalluvar has regarded wealth as only a means and not an end. He said, "Acquire a great fortune by noble and honorable means." He condemned hoarding and described hoarded wealth as profitless richness. To him industry is real wealth and labour is the greatest resource.

h. Welfare State

Thiruvalluvar is for a welfare state. In a welfare state there will be no poverty, illiteracy, disease and insecurity. The important elements of a welfare state are 1) perfect health of the people without disease 2) abundant wealth, 3) good crop 4) prosperity and happiness and 5) full security for the people.

7.8.2 Mahatma Gandhi



Gandhian Economics is based on ethical foundations. In 1921, Gandhi wrote, "Economics that hurts the moral well-being of an individual or a nation is immoral, and therefore, sinful." Again in 1924, he repeated the same belief: "that economy is untrue which ignores or disregards moral values".

Salient Features of Gandhian Economic Thought

1. **Village Republics**: To Gandhi, India lives in villages. He was interested in developing the villages as self-sufficient units. He opposed extensive use of machinery, urbanization and industrialization.
2. **On Machinery**: Gandhi described machinery as 'Great sin'. He said that "Books could be written to demonstrate its evils… it is necessary to realize that machinery is bad. Instead of welcoming machinery as a boon, we should look down upon it as an evil. It would ultimately cease.
3. **Industrialism**: Gandhi considered industrialism as a curse on mankind. He thought industrialism depended entirely on a country's capacity to exploit.
4. **Decentralization:** He advocated a decentralized economy, i.e., production at a large number of places on a small scale or production in the people's homes.
5. **Village Sarvodaya:** According to Gandhi, "Real India was to be found in villages and not in towns or cities."

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So he suggested the development of self-sufficient, self-dependent villages.

6. **Bread Labour**: Gandhi realized the dignity of human labour. He believed that God created man to eat his bread by the sweat of his brow. Bread labour or body labour was the expression that Gandhi used to mean manual labour.

7. **The Doctrine of Trusteeship:** Trusteeship provides a means of transforming the present capitalist order of society into an egalitarian one. It gives no quarter to capitalism. However, now India experiences both casino capitalism and crony capitalism

8. **On the Food Problem:** Gandhi was against any sort of food controls. He thought such controls only created artificial scarcity. Once India was begging for food grain, but now India tops the world with very large production of foodgrains, fruits, vegetables, milk, egg,meat etc.,

9. **On Population:** Gandhi opposed the method of population control through contraceptives. He was, however, in favour of birth control through Brahmacharya or self-control. He considered self-control as a sovereign remedy to the problem of over-population.

10. **On Prohibition:** Gandhi advocated cent per cent prohibition. He regarded the use of liquor as a disease rather than a vice. He felt that it was better for India to be poor than to have thousands of drunkards. But now many states depend on revenue from liquor sales.

7.8.3 Jawaharlal Nehru



Jawaharlal Nehru, one of the chief builders of Modern India, was the first Prime Minister of Independent India and he was there in that post till his death in 1964. He was a great patriot, thinker and statesman. His views on economics and social problems are found in the innumerable speeches he made and in the books he wrote.

a. Democracy and Secularism

Jawaharlal Nehru was a firm believer in democracy. He believed in free speech civil liberty,adult franchise and the Rule of Law and Parliamentary democracy. Secularism, is another signal contribution of Nehru to India. In our country, there are many religions - Hinduism, Islam, Christianity, Buddhism, Jainism, Zoroastrianism, Sikhism and so on. But there is no domination by religious majority. Secularism means equal respect for all religions.

b. Planning

Jawaharlal Nehru was responsible for the introduction of planning in our country. To Jawaharlal Nehru, the Plan was essentially an integrated approach for development. Initiating the debate on the Second Plan in the Lok Sabha in May 1956, Nehru spoke on the theme of planning. He said, *"the essence of planning is to find the best way to utilize all resources of manpower, of money and so on." Planning, for Nehru, was essentially linked up with industrialization and eventual self-reliance*

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for the country's economic growth on a self- accelerating growth. Nehru carried through this basic strategy of planned development. Nehru's contribution to the advancement of science, research, technology and industrial development cannot be forgotten. It was during his period, many IITs and Research Institutions were established. He always insited on "scientific temper".

c. Democratic Socialism

Socialism is another contribution of Nehru to India. He put the country on the road towards a socialistic pattern of society. But Nehru's socialism is democratic socialism.

7.8.4 B. R. Ambedkar



B. R. Ambedkar (1891-1956) was a versatile personality. He was the architect of the Indian Constitution, a custodian of social justice and a champion of socialism and state planning. Ambedkar's writings included "Ancient Indian Commerce" (a thesis submitted to the Columbia University for the award of the Master of Arts Degree in 1915), 'National Dividend of India: A Historical and Analytical Study (a thesis for which he was awarded Ph.D). His thesis was published as 'The Evolution of Provincial Finance in British India: A Study of the Provincial Decentralization of Imperial Finance".

Ambedkar's thesis on "Provincial Decentralization of Imperial Finance in British India" was accepted for the M.Sc degree in 1921. And his thesis" The Problem of the Rupee" was accepted for the award of the D.Sc degree by the London School of Economics in 1923. It is a miracle that RBI was conceptualized as per the guidelines presented by Ambedkar in his book, "The Problem of the Rupee;Its origin and its solution". The main economic ideas of Ambedkar may be studied under four broad headings:

1. **Financial Economics**

   Much of the work done by Ambedkar during his stay abroad mostly during the period 1913-1923, was in the field of Finance Economics. Ambedkar divided the evolution of provisional finance into three stages: (i). Budget by Assignment (1871-72 to 1876-77); (ii) Budget by Assigned Revenue (1877-78 to 1881-82); and (iii) Budget by Shared Revenues (1882-83 to 1920-1921).

2. **Agricultural Economics**

   In 1918, Ambedkar published a paper "Small Holding in India and their Remedies". Citing Adam Smith's 'Wealth of Nations", he made a fine distinction between "Consolidation of Holdings" and "Enlargement of Holdings".

3. **Economics of Caste**

   Ambedkar believed that caste was an obstacle to social mobility. It resulted in social stratification. He was of the firm view that individuals must be free to change their occupations. Moreover, the caste system caused social tensions. The caste system has resulted in the absence of social democracy in India as distinct from political democracy.

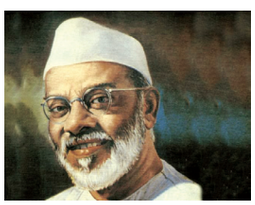
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4. Economics of Socialism

Ambedkar was a socialist. He was a champion of state socialism. He advocated the nationalization of all key industries and suggested state ownership of land and collective farming. He was for state monopoly of insurance business. Not only that, he advocated compulsory insurance for every citizen.

There is no doubt that Ambedkar was a great economist. But his academic work as an economist was eclipsed by his greater contributions in the field of law and politics. Above all he was a great social reformer.

7.8.5 J. C. Kumarappa



Joseph Chelladurai Kumarappa was born on 4 January 1892 in Tanjavur, Tamil Nadu. A pioneer of rural economic development theories, Kumarappa is credited for developing economic theories based on Gandhism – a school of economic thought he coined "*Gandhian Economics*".

Gandhian Economics

J.C.Kumarappa strongly supported Gandhi's notion of village industries and promoted Village Industries Associations. Kumarappa worked to combine Christian and Gandhian values of "trusteeship", non-violence and a focus on human dignity and development in place of materialism as the basis of his economic theories. While rejecting socialism's emphasis on class war and force in implementation, he also rejected the emphasis on material development, competition and efficiency in free-market economies. Gandhi and Kumarappa envisioned an economy focused on satisfying human needs and challenges while rooting out socio-economic conflict, unemployment, poverty and deprivation.

Kumarappa worked as a Professor of economics at the Gujarat Vidyapith in Ahmedabad, while serving as the editor of *Young India* during the Salt Satyagraha. He founded the All India Village Industries Association in 1935; and was imprisoned for more than a year during the Quit India movement. He wrote during his imprisonment, *Economy of Permanence*: *The Practice and Precepts of Jesus* (1945) and *Christianity: Its Economy and Way of Life* (1945).

Several of Gandhi's followers developed a theory of environmentalism. Kumarappa took the lead in a number of relevant books in the 1930s and 1940s. Historian Ramachandra Guha calls Kumarappa, "The Green Gandhian," portraying him as the founder of modern environmentalism in India.

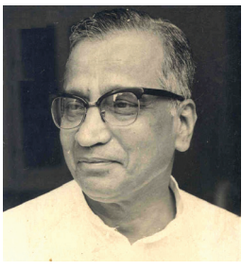
Kumarappa worked for the Planning Commission of India and the Indian National Congress to develop national policies for agriculture and rural development. He also travelled to China, Eastern Europe and Japan on diplomatic assignments and to study their rural economic systems.

7.8.6 V.K.R.V. Rao

According to P.R. Brahmananda, " *the great trinity of pre-independent and post independent Indian economists consisted of D.R.Gadgill, C.N.Vakil and V.K.RV. Rao. These scholars were imbibed with a missionary zeal and analyzed the Indian economic problems with*

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a view to designing and propagating economic policies/programmes and plans to India's national advantage." V.K.R.V: Rao was a prolific writer.



V.K.R.V: Rao was deeply interested in three large themes. They were:

i. National Income,

ii. Food, nutrition and the distribution of good; and

iii. Employment and occupational distributions.

1. National Income Methodology

As an applied economist, Rao's name is remembered for his pioneering work on the enumeration of national income of India. Rao was a pupil of J.M. Keynes and he worked with Colin Clark. H.W Singer considered V.K.R.V Rao as " the best equipped of all Keynes' pupils. He attempted (i) to develop the national income concepts suited to India and developing countries generally; (ii) to analyze the concepts of investment, saving and the multipliers in an underdeveloped economy; and (iii) to study the compatibility of the national incomes of industrialized and underdeveloped countries. Rao's paper on "Full Employment and Economic Development" was one of the earliest contributions in the field of development towards employment.

2. International Food Aid

Rao was influential in creating ideas and shaping policy in the international attack on world poverty, not only through his contributions to the question of international aid and improved flows of external resources, but also through his activities in the field of food aid.

3. Support for Socialism

During the early phases of planning in India, Rao supported the case of a socialist India, where the state would control the commanding heights of the economy and the public sector would play a dominant role in economic development.

4. Rao's Views on Industrialization

In his pamphlet "What is wrong with Indian Economic Life?' (1938), Rao gave the following reasons for low per capita income and low levels of per capita nutrition in India.

i. Uneconomic holdings with sub-divisions and fragmentation;

ii. Low levels of water availability for crops;

iii. Excess population pressure on agriculture due to the absence of a large industrial sector;

iv. Absence of capital;

v. Absence of autonomy in currency policy, and in general in monetary matters encouraging holding of gold.

5. Village Clusters

Rao felt that rural communities had to be given a viable base. Therefore he suggested that a cluster of villages should form a unit for rural development, so that both social and economic interactions between villages could develop, and they could effectively generate and fashion

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their own development with a more meaningful participation by people.

6. **Investment, Income and Multiplier**

Rao's examination of the "interrelation between investment, income and multiplier in an under developed economy" (1952) was his major contribution to macroeconomic theory. As a thinker, teacher, economic adviser and direct policy maker, V.K.R.V. Rao followed the footsteps of his great teacher, John Maynard Keynes.

7. **Institution Builder**

He founded three national level research institutes namely Delhi School of Economics, Institute of Economic Growth (both at Delhi) and Institute for Social and Economic Change (Bangalore)

Justice party : Kamaraj's, Periyar's rural ecnomic plans or programmes

7.8.7 Amartya Kumar Sen



The Nobel citation refers to Sen's contributions to social choice theory, development economics, study on poverty and famines and concept of entitlements and capability development (1998).

1. **Poverty and Famines**

Sen's Poverty and Famines: An Essay on Entitlement and Deprivation" (1981) is both a theoretical and an applied work. In the book, several famines have been studied in the working of a general theoretical framework from an original angle. He examined various meanings of poverty and drew attention to the incidence of absolute and relative deprivation.

2. **Poverty and Inequality**

Sen has carried out massive work on poverty and inequality in India. Sen's major point has been that the distribution of income/consumption among the persons below the poverty line is to be taken into account.

3. **The Concept of Capability**

The concept of capabilities developed by Sen has been cited as a better index of wellbeing than commodities or utilities. Capability, as defined by Sen, is the ability to transform Rawlsian primary goods to the achievement of wellbeing.

4. **Entitlement**

Sen has included the concept of entitlement items like nutrition, food, medical and health care, employment, security of food supply in times of famine etc. He considered famine as arising out of the failure of establishing a system of entitlements.

5. **Choice of Technique**

Sen's 'Choice of Technique ' was a research work where he argued that in a labour surplus economy, generation of employment cannot be increased at the initial stage by the adaptation of capital- intensive technique.

Conclusively, Amartyasen, more than just an economist, is an ethical philosopher. He is a lover of freedom and a humanist. He has focused on the poor, viewing them not as objects of pity requiring charitable hand–outs,

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but as disempowered folk needing empowerment, education,health, nutrition, gender equality,safety net in times of distress; all are needed to empower people.

7.9 Conclusion

This lesson mainly focused on some of the aspects of the Indian Economy and its resources, infrastructure facilities and energy, It also discussed the principles of Indian Economic thinkers to motivate the students to read good books on Economics Written by the great economists.

Glossary

Economic Growth	Transformation of an economy from a state of under development to a state of development which is measured by Gross Domestic Product (GDP).
Economic Development	An improvement in citizens quality of life and well being of a country which is measured by per capita income along with several other development indicators.
Gross Domestic Product	Total monetary value of the goods and services produced by that country over a specific period of time, normally a year. By utilising it's own resources
Per Capita Income	Average national income per head of population. It is obtained by dividing the National Income by population size.
Natural Resources	Goods and services provided by the nature. In other words, any stock or reserve that can be drawn from nature.
Renewable Resources	Resources that can be regenerated in a given span of time.
Non-Renewable Resources	Resources that are exhaustive and cannot be regenerated
Deforestation	Clearing of forests, trees and thereby forest land is converted to a non-forest use.
Energy Crisis	Situation in which energy resources are less than the demand and there is shortage of energy.
Doctrine of Trusteeship	Donors who act as the trustees of their property or business.

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MODEL QUESTIONS

Part-A Multiple Choice Questions

1. The main gold mine region in Karnataka is ……..
   - a. Kolar
   - b. Ramgiri
   - c. Anantpur
   - d. Cochin



2. The measure of economic growth of a country is indicated by …..
   - a. GNP
   - b. GDP
   - c. NNP
   - d. Per capita income

3. Which one of the following is a developed nations ?
   - a. Mexico
   - b. Ghana
   - c. France
   - d. Sri Lanka

4. The position of Indian Economy among the other strongest economies in the world is ..
   - a. Fourth
   - b. Seventh
   - c. Fifth
   - d. Tenth

5. Mixed economy means ……
   - a. Private sectors and banks
   - b. Co-existence of Public and Private sectors
   - c. Public sectors and banks
   - d. Public sectors only

6. The weakness of Indian Economy is …….
   - a. Economic disparities
   - b. Mixed economy
   - c. Urbanisation
   - d. Adequate employment opportunities

7. A scientific study of the characteristics of population is ….
   - a. Topography
   - b. Demography
   - c. Geography
   - d. Philosophy

8. The year 1961is known as …..
   - a. Year of small divide
   - b. Year of Population Explosion
   - c. Year of Urbanisation
   - d. Year of Great Divide

9. In which year the population of India crossed one billion mark ?
   - a. 2000
   - b. 2001
   - c. 2005
   - d. 1991

10. The number of deaths per thousand population is called as …
    - a. Crude Death Rate
    - b. Crude Birth Rate
    - c. Crude Infant Rate
    - d. Maternal Mortality Rate

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11. The number of births per thousand population is called as

a. Crude death rate

b. Mortality rate

c. Morbidity rate

d. Crude Birth Rate

12. Density of population =

a. Land area / Total Population

b. Land area / Employment

c. Total Population / Land area of the region

d. Total Population / Employment

13. Who introduced the National Development Council in India?

a. Ambedkar

b. Jawaharlal Nehru

c. Radhakrishanan

d. V.K.R.V. Rao

14. Who among the following propagated Gandhian Ecomomic thinkings.

a. Jawaharlar Nehru

b. VKRV Rao

c. JC Kumarappa

d. A.K.Sen

15. The advocate of democratic socialism was

a. Jawaharlal Nehru

b. P.C. Mahalanobis

c. Dr. Rajendra Prasad

d. Indira Gandhi

16. The problem studied by Ambedkar in the context of Indian Economy is .....

a. Small land holdings and their remedies

b. Problem of Indian Currency

c. Economics of socialism

d. All of them

17. Gandhian Economics is based on the Principle

a. Socialistic idea

b. Ethical foundation

c. Gopala Krishna Gokhale

d. Dadabhai Naoroji

18. V.K.R.V Rao was a student of

a. J.M. Keynes

b. Colin Clark

c. Adam smith

d. Alfred Marshal

19. Amartya Kumara Sen received the Nobel prize in Economics in the year

a. 1998

b. 2000

c. 2008

d. 2010

20. Thiruvalluvar's economic ideas mainly dealt with

a. Wealth

b. Poverty is the curse in the society

c. Agriculture

d. All of them

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Part- A - Answers

1	2	3	4	5	6	7	8	9	10
a	b	c	b	b	a	b	b	b	a
11	12	13	14	15	16	17	18	19	20
d	c	b	c	a	b	b	a	a	d

Part-B Answer the following questions in one or two sentences.

21. Write the meaning of Economic Growth.
22. State any two features of developed economy.
23. Write short note on natural resources.
24. Point out any one feature of Indian Economy.
25. Give the meaning of non-renewable energy.
26. Give a short note on Sen's 'Choice of Technique'.
27. List out the reasons for low per capita income as given by V.K.R.V. Rao.

Part-C Answer the following questions in one paragraph.

28. Define Economic Development.
29. State Ambedkar's Economic ideas on agricultural economics.
30. Write a short note on village sarvodhaya.
31. Write the strategy of Jawaharlal Nehru in India's planning.
32. Write V.K.R.V.Rao's contribution to macro economics.
33. Write a short note on Welfare Economics given by Amartya Sen.
34. Explain Social infrastructure.

Part-D Answer the following questions in about a page

35. Explain the strong features of Indian economy
36. Write the importance of mineral resources in India.
37. Bring out Jawharlal Nehru's contribution to the idea of economic development.
38. Write a brief note on the Gandhian economic ideas.

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ACTIVITY

1. *Visit a village nearby you and find out the number households living without basic facilities*

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CHAPTER

8 Indian Economy Before and After Independence

Freedom is never dear at any price. It is the breath of life. What would a man not pay for living?

–Tyler Cowen

Learning Objectives

1. To understand the experience of India during British Rule
2. To analyse the efforts taken by the Government of India after Independence,

8.1 Introduction

This chapter discusses the major events that took place in India before and after Independence. India was a colony for long. Colonialism refers to a system of political and social relations between two countries, of which one is the ruler and the other is its colony. The ruling country not only has political control over the colony, but it also determines the economic policies of the subjugated country. Thus, the people living in a colony cannot take independent decisions in respect of utilisation of the country's resources and important economic activities. India had the bitter experience of colonialism.

8.2 Indian Economy during the British Period

Indian's sea route trade to Europe started even during the Sangam Age and took a new turn only after the arrival of **Vasco da Gama** in Calicut, India on May 20, 1498. The Portuguese had traded in Goa as early as 1510. In 1601 the English East India Company was chartered, and the English began their first inroads into the Indian Ocean. In 1614 Sir Thomas Roe was successful in getting permission from **King Jahangir** for setting up factories and slowly moved in to all parts of India.

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History of British Period

During the British period

*Before the advent of the British, Indian practically lived in village. Thus the economy of the village was self sufficient. But under the British rule only industries were allowed to develop.

*These economic and organizational changes brought down the economic condition of Indians. All the problems are chiefly related with health, housing, child and woman welfare and labour, recreation, crime and social disorganization. Due to these problems, the need for organized social work was realized.

Hundred years after the Battle of Plassey, the rule of the English East India Company finally did come to an end. In 1858, British Parliament passed a law through which the power for governance of India was transferred from the English East India Company (EIC) to the British crown. Even the transfer of power from the English East India Company to the British Crown did not materially alter the situation.

Britain had exploited India over a period of two centuries of its colonial rule. On the basis of the form of colonial exploitation, economic historians have divided the whole period into three phases: namely the period of merchant capital, the period of industrial capital, the period of finance capital.

8.2.1 Period of Merchant Capital

- The period of merchant capital was from 1757 to 1813.
- The only aim of the English East India Company was to earn profit by establishing monopoly trade in the goods with India and parts of East India's.
- During this period, India had been considered as the best hunting ground for capital by the East India company to develop industrial capitalism in Britain.
- When Bengal and South India came under political shake of the East India company in 1750s and 1760s, the objective of monopoly trade was fulfilled.
- The company administration succeeded in generating huge surpluses which were repatriated to England, and the Indian leaders linked this problem of land revenue with that of the drain.
- Above all, the officers of the company were unscrupulous and corrupt.

8.2.2 Period of Industrial Capital

- The period of Industrial capital was from 1813 to 1858.
- During this period, India had become a market for British textiles.
- India's raw materials were exported to England at low price and were finished textile commodities to India at high price. In this way, Indians were exploited.
- India's traditional handicrafts were neglected.

8.2.3 Period of Finance Capital

- The third phase was the period of finance capital starting from the closing years of the 19th century and

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continuing till independence. During this period, finance imperialism began to entrench itself through the managing agency firms, export – import firms, exchange banks and some export of capital.

- Britain decided to make massive investments in various fields (rail, road, postal system irrigation, European banking system, and a limited field of education etc) in India by plundering Indian capital.
- Railway construction policy of the British was compelled to poor Indian's tax payers to finance the construction of railways. The political power was handed over to the British Government by the English East India Company in 1858.



8.2.4 Decline of Indian Handicrafts

- The Indian handicrafts had a worldwide market. Indian exports consisted chiefly of hand woven cotton and silk fabrics, calicoes, artistic wares, wood carving etc.
- Through discriminatory tariff policy, the British Government purposefully destroyed the handicrafts.
- With the disappearance of nawabs and kings, there was no one to protect Indian handicrafts.
- Indian handicrafts could not compete with machine-made products.
- The introduction of railways in India increased the domestic market for the British goods.

8.3 The Land Tenure Systems in India

Land Tenure refers to the system of land ownership and management.The features that distinguish a land tenure system from the others relate to the following:

(a) Who owns the land ;

(b) Who cultivates the land;

(c) Who is responsible for paying the land revenue to the government.

Based on these questions, three different types of land tenure existed in India before Independence. They were Zamindari system, Mahalwari system and Ryotwari system.

8.3.1 Zamindari System or the Land lord-Tenant System

This system was created by the British East India Company, when in 1793, Lord Cornwallis introduced 'Permanent Settlement Act'. Under this system the landlords or the Zamindars were declared as the owners of the land and they were responsible to pay the land revenue to the government. The share

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of the government in total rent collected was fixed at 10/11th, the balance going to the Zamindars as remuneration.

8.3.2 Mahalwari System or Communal System of Farming

After introduction of this system, it was later extended to Madhya Pradesh and Punjab. The ownership of the land was maintained by the collective body usually the villagers which served as a unit of management. They distributed land among the peasants and collected revenue from them and paid it to the state.

8.3.3 Ryotwari System or the Owner-Cultivator System

This system was initially introduced in Tamil Nadu and later extended to Maharashtra,Gujarat, Assam, Coorg, East Punjab and Madhya Pradesh. Under this system the ownership rights of use and control of land were held by the tiller himself. There was a direct relationship between the owners and tillers. This system was the least oppressive system before Independence.

8.4 Process of Industrial Transition and Colonial Capitalism

This process of industrial transition in India during the British period can be broadly classified into two as given below:

(a) Industrial growth during the 19th century

During the 19th century, British investors started to pioneer industrial enterprises in India as they had experiences of running industries at home. British enterprises also received maximum state support. Although the Britishers initiated industrialisation process in the 19th century, they were primarily interested in making profit and not in accelerating the economic growth in India. At the end of 19th century, there were about 36 jute mills, 194 cotton mills and a good number of plantation industries. The production of coal had risen to over 6 million tonnes per annum.

(b) Industrial progress during the 20th century

During the first part of 20th century, Swadeshi movement stimulated the industrialisation process in India. The existing industries and new industries had maintained a slow but steady growth till the outbreak of the First World War in 1914.By this time more than 70 cotton mills and 30 jute mills were set up. Coal production was doubled. The foundation of iron and steel industry was laid. Railway network was extended.

During the period 1924-39, various major industries like iron and steel, cotton textiles, jute, matches, sugar, paper and pulp industry etc. were brought under protection scheme against foreign competition. This led to rapid expansion of protected industries in India. These protected industries captured the entire Indian market and eliminated foreign competition totally.

Thus in the early part, British rule tried to transform the Indian economy as

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the producer of industrial raw materials and tried to capture Indian market for their industrial finished goods and thus started exploiting Indian economy in a different way. Later on, British capitalists gradually developed various industries like, jute, tea, coffee, cotton and textiles, paper and paper pulp, sugar etc, in India for locational advantages and exploited Indian labourers extensively.

8.5 Problems of British Rule

1. The British rule stunted the growth of Indian enterprise.
2. The economic policies of the British checked and retarded capital formation in India.
3. The drain of wealth from India financed capital development in Britain.
4. Indian agricultural sector became stagnant and deteriorated even when a large section of Indian population was dependent on agriculture for subsistence.
5. The British rule in India led to the collapse of handicraft industries without making any significant contribution to the development of any modern industrial base.
6. Some efforts by the colonial British regime in developing the plantations, mines, jute mills, banking and shipping, mainly promoted a system of capitalist firms that were managed by foreigners. These profit motives led to further drain of resources from India.

8.6 Important Industrial Policies Prior to 1991

India is the Asia's third largest economy. The 70 years of Independence have brought a remarkable change in the socio economic landscape of India.

Industrial Policy of India

1948, 1956, 1977, 1980, 1990 & 1991

Economic development of a country particularly depends on the process of industrialisation. At the time of Independence, India inherited a weak and shallow industrial base. Therefore during the post–Independence period, the Government of India laid special emphasis on the development of a solid industrial base. The Industrial Policy Resolutions of 1948 and 1956 clearly stated the need for developing both small scale industries and large scale industries.

8.6.1 Industrial Policy Resolutions 1948

The Government of India recognized the significant contribution of industrialization. Therefore the Government of India declared its first Industrial Policy on 6th April 1948. The main importance of this policy was that it ushered in India the system of mixed economy.

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Industrial Policies

Industrial Policy 1948 –

Center's Monopoly : Government of India's Monopoly shall include Railways, Arms and Ammunition, Atomic Energy, Postal Department.

State's Monopoly : State Monopoly shall include natural resources like coal, steel, manufacture of aircraft, cement, rubber, automobile, wireless apparatus (Radio Receiving Sets) and mineral oil.

Unregulated Private Enterprises : It was kept open to private enterprises of individuals and co-operative societies to also involve.

1. Industries were classified into four groups such as public sector (strategic industries), public–cum –private sector (key industries), controlled private sector, private and co-operative sectors.
2. This policy endeavoured to protect cottage and small scale industries.
3. The central and state governments had a virtual monopoly in rail roads and exclusive rights to develop minerals, iron ore etc.
4. The Government encouraged the significance of foreign capital for industrialization but the government decided that the control should remain with Indian hands.

8.6.2 Industrial Policy Resolution 1956

1. The Industrial Policy of 1956 sought to give a dominant role to public sector. At the same time, it assured a fair treatment to the private sector.
2. The Government would support and encourage cottage and small scale enterprises by restricting volume of production in the large scale sector by differential taxation or by direct subsidies.
3. This industrial policy emphasized the necessity of reducing the regional disparities in levels of development.

Industrial Resolution Policy – 1956

Shaped by the Mahalanobis Model of growth, which suggested that emphasis on heavy industries would lead the economy towards a long term higher growth path.

The Industrial Policy Resolution – 1956 classified industries into three categories;

17 Industries :
exclusively under the domain of the Government.
These included inter alia, railways, air transport, arms and ammunition, iron and steel and atomic energy.

12 Industries :
Which were envisaged to be progressively Stateowned but Private Sector was expected to supplement the efforts of the State.

The third category contained all the remaining industries and it was expected that private sector would initiate development of these industries but they would remain open for the State as well.

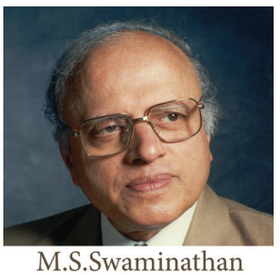
4. The Government recognized the need for foreign capital for progressive Indianisation of foreign concerns.

8.6.3 Industrial Policy Resolution 1991

1. The main objective was to open the Indian Economy in to the Globalisation arena.
2. It provides a new direction to the Indian Market.
3. It focused on reducing the rate of inflation and building up foreign exchange reserves to accelerate the economic growth of a country.

8.7 Green Revolution

The term Green Revolution refers to the technological breakthrough in agricultural practices. During 1960's the traditional agricultural practices were gradually replaced by modern technology and


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agricultural practices in India. Initially the new technology was tried in 1960-61 as a pilot project in seven districts. It was called as the High Yielding Varieties Programme (HYVP).

Achievement of Green Revolution

(i) The major achievement of the new strategy was to boost the production of major cereals viz., wheat and rice. India was depending on the US for the food grain. The US by using Public Law 480 (PL480) exported wheat to India. Indians were waiting for the ships to sip their food. On the other hand, India has lots of minerals. The US could strategically exploit Indian mineral resources at cheapest price for manufacturing missiles and weapons, which gave job opportunity for larger US youth and largely contributed to US GDP. But now India is food surplus, exporting food grains to the European countries.

(ii) The Green revolution was confined only to High Yielding Varieties (HYV) cereals, mainly rice, wheat, maize and jowar.

(iii) This Strategy was also directed to increase the production of commercial crops or cash crops such as sugarcane, cotton, jute, oilseeds and potatoes.

(iv) Per hectare productivity of all crops had increased due to better seeds.

(v) Green Revolution had positive effect on development of industries, which manufactured agricultural tools like tractors, engines, threshers and pumping sets.

(vi) Green Revolution had brought prosperity to rural people. Increased production had generated employment opportunities for rural masses. Due to this, their standard of living had increased.

(vii) Due to multiple cropping and more use of chemical fertilizers, the demand for labour increased.

(viii) Financial resources were provided by banks and co-operative societies. These banks provided loans to farmers on easy terms.

The New Agricultural strategy was also called by various names. Modern agricultural technology, seed – fertilizer – water technology, or simply green revolution.

Weaknesses of Green Revolution

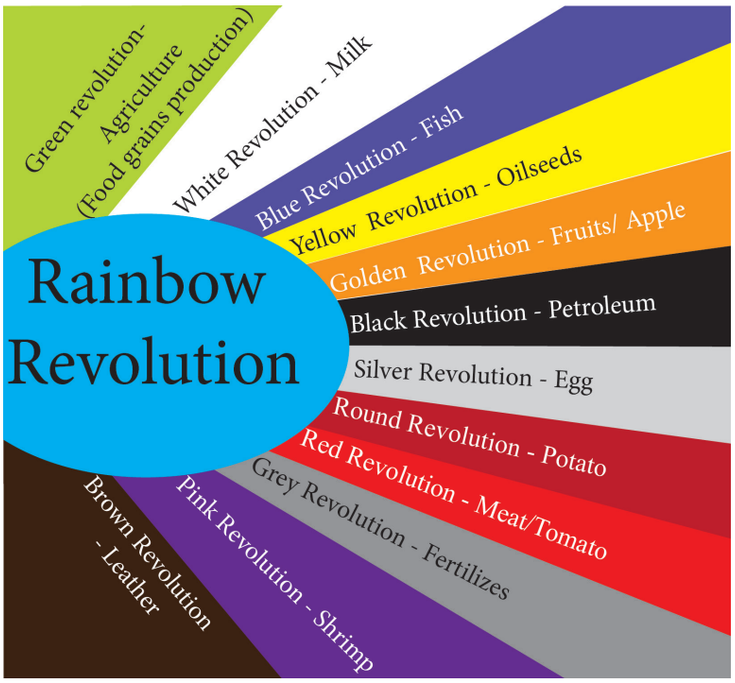
(i) Indian Agriculture was still a gamble of the monsoons.

(ii) This strategy needed heavy investment in seeds, fertilizers, pesticides and water.

(iii) The income gap between large, marginal and small farmers had increased. Gap between irrigated and rain fed areas had widened.

(iv) Except in Punjab, and to some extent in Haryana, farm mechanization had created widespread unemployment among agricultural labourers in the rural areas.

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(v) Larger chemical use and inorganic materials reduced the soil fertility and spoiled human health. Now organic farming is encouraged.

Second Green Revolution

The Government of India had implemented 'Second Green revolution' to achieve higher agricultural growth. The target of Second Green Revolution was to increase 400 million tonnes of food grain production as against 214 million tonnes in 2006-07. This is to be achieved by 2020. In agricultural sector, the growth rate of 5% to 6% has to be maintained over next 15 years. There may be changes in these statistics.

Requirements of Second Green revolution:

- Introduction of Genetically Modified (GM) seeds which double the per acreage production.
- Contribution of private sector to market the usage of GM foods.
- Government can play a key role in expediting irrigation schemes and managing water resources.
- Linking of rivers to transfer surplus water to deficient areas.

8.8 Large Scale Industries

The term "Large scale industries" refers to those industries which require huge infrastructure, man-power and have influx of capital assets. The term 'large scale industries' is a generic one including various types of industries in its purview. All the heavy industries of India like the iron and steel industry, textile industry, automobile manufacturing industry fall under the large scale industrial arena. However in recent years due to the IT boom and the huge amount of revenue generated by it, the IT industry can also be included within the jurisdiction of the large scale industrial sector. Indian economy is heavily dependent

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on these large industries for its economic growth, generation of foreign currency and for providing job opportunities to millions of Indians. The following are the major large scale industries in India.

1. Iron and steel industry

- First steel industry at Kulti, Near Jharia, West Bengal - Bengal iron works company in 1870.



- First large scale steel plant TISCO at Jamshedpur in 1907 followed by TISCO at Burnpur in 1919. Both belonged to private sector.
- The first public sector unit was "Vishveshvaraya Iron and Steel works" at Bhadrawati.

Public sector steel plants

Location	Assistance
Rourkela (Odissa)	Germany
Bhilai (MP)	Russia
Durgapur (WB)	UK
Bokaro (Jharkhand)	Russia
Burnpur (WB)	Acquired from private sector in 1976
Vishakhapattnam (AP)	Russia
Salem (Tamil Nadu)	Government of India (No external assistance)
Vijai Nagar (Karnataka)	Government of India
Bhadrawati (Karnataka)	Nationalisation of Vishveshvarayya Iron and Steel Ltd(owned by Centre and State government)

- All these are managed by SAIL (at present all important steel plants except TISCO, are under public sector)
- Steel Authority of India Ltd (SAIL) was established in 1974 and was made responsible for the development of the steel industry.
- Presently India is the eighth largest steel producing country in the world.

2. Jute industry

- Jute industry is an important industry for a country like India, because not only it earns foreign exchange but also provides substantial employment opportunities in agriculture and industrial sectors.
- Its first modernised industrial unit was established at Reshra in West Bengal in 1855.
- The jute industry in the country is traditionally export oriented. India

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ranks number one in the raw jute and jute goods production and number two in export of jute goods in the world.

3. Cotton and textile industry

- Oldest industry of India, and employs largest number of workers.
- It is the largest organised and broad-based industry which accounts for 4% of GDP, 20% of manufacturing value-added and one third of total export earnings.
- The first Indian modernised cotton cloth mill was established in 1818 at Fort Gloaster near Calcutta. But this mill was not successful. The second mill named "Mumbai's Spinning and Weaving Co." was established in 1854 at Bombay by KGN Daber.

4. Sugar industry

- Sugar industry is the second largest industry among agriculture-based industries in India.
- India is now the largest producer and consumer of sugar in the world. Maharashtra contributes over one third of the Indian total sugar output, followed closely by Uttar Pradesh.

5. Fertiliser industry

- India is the third largest producer of nitrogenous fertilisers in the world.

6. Paper industry

- The first mechanised paper mill was set up in 1812 at Serampur in West Bengal.
- The paper industry in India is ranked among the 15 top global paper industries.

7. Silk industry

- India is the second-largest(first being China) country in the world in producing natural silk. At present, India produces about 16% silk of the world.
- India enjoys the distinction of being the only country producing all the five known commercial varieties of silk viz Mulberry, Tropical Tussar, Oak Tussar, Eri and Muga.

8. Petroleum and natural gas

- First successful Oilwell was dug in India in 1889 at Digboi, Assam.
- At present a number of regions with oil reserves have been identified and oil is being extracted in these regions
- For exploration purpose, Oil and Natural Gas Commission (ONGC) was established in 1956 at Dehradun, Uttarakhand

8.9 Small Scale Industries

Small scale industries play an important role for the development of Indian economy in many ways. About 60 to 70 percent of the total innovations in India comes from the SSIs. Many of the big businesses today were all started small and then nurtured into big businesses. The role of SSIs in economic development of the country is briefly explained in the forthcoming paragraphs.

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Role of SSIs in Economic Development

1. Provide Employment

- SSIs use labour intensive techniques. Hence, they provide employment opportunities to a large number of people. Thus, they reduce the unemployment problem to a great extent.
- SSIs provide employment to artisans, technically qualified persons and professionals, people engaged in traditional arts, people in villages and unorganized sectors.
- The employment-capital ratio is high for the SSIs.

2. Bring Balanced Regional Development

- SSIs promote decentralized development of industries as most of the SSIs are set up in backward and rural areas.
- They remove regional disparities by industrializing rural and backward areas and bring balanced regional development.
- They help to reduce the problems of congestion, slums, sanitation and pollution in cities. They are mostly found outside city limits.
- They help in improving the standard of living of people residing in suburban and rural areas in India.
- The entrepreneurial talent is tapped in different regions and the income is also distributed instead of being concentrated in the hands of a few individuals or business families.

3. Help in Mobilization of Local Resources

- SSIs help to mobilize and utilize local resources like small savings, entrepreneurial talent etc., of the entrepreneurs, which might otherwise remain idle and unutilized.
- They pave way for promoting traditional family skills and handicrafts. There is a great demand for handicraft goods in developed countries.
- They help to improve the growth of local entrepreneurs and self-employed professionals in small towns and villages in India.

4. Pave for Optimisation of Capital

- SSIs require less capital per unit of output. They provide quick return on investment due to shorter gestation period. The payback period is quite short in SSIs.
- SSIs function as a stabilizing force by providing high output-capital ratio as well as high employment-capital ratio.
- They encourage the people living in rural areas and small towns to mobilize savings and channelize them into industrial activities.

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5. **Promote Exports**

- SSIs do not require sophisticated machinery. Hence, import the machines from abroad is not necessary. On the other hand, there is a great demand for goods produced by SSIs.Thus they reduce the pressure on the country's balance of payments. However, in the recent past large scale industries are able to borrow large funds with low interest rate and spend large sums on advertisements. Hence SSSs are gradually vanishing.
- SSIs earn valuable foreign exchange through exports from India.

6. **Complement Large Scale Industries**

- SSIs play a complementary role to large scale sector and support the large scale industries.
- SSIs provide parts, components, accessories to large scale industries and meet the requirements of large scale industries through setting up units near the large scale units.
- SSIs serve as ancillaries to large scale units.

7. **Meet Consumer Demands**

- SSIs produce wide range of products required by consumers in India.
- Hence, they serve as an anti-inflationary force by providing goods of daily use.

8. **Develop Entrepreneurship**

- SSIs help to develop a class of entrepreneurs in the society. They help the job seekers to become job givers.
- They promote self-employment and spirit of self-reliance in the society.
- SSIs help to increase the per capita income of India in various ways.
- They facilitate development of backward areas and weaker sections of the society.
- SSIs are adept in distributing national income in more efficient and equitable manner among the various participants of the society.

8.10 Micro, Small and MediumEnterprises (MSMEs)

As on now, the following monetary limits have been used for defining different kinds of industrial service units. However, these limits are subject to changes over time.

Manufacturing Enterprises

a. **Micro Manufacturing Enterprises:** The investment in plant and machinery does not exceed ₹25 lakhs.

b. **Small Manufacturing Enterprises:** The investment in plant and machinery is more than twenty five lakh rupees but does not exceed ₹5 crores.

c. **Medium Manufacturing Enterprises:** The investment in plant and machinery is more than ₹5 crores but not exceeding ₹10 crores.

Service Enterprises

a. **Micro Service Enterprises:** The investment in equipment does not exceed ₹10 lakhs.

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b. Small Service Industries: The investment in equipment is more than ₹10 lakhs but does not exceed ₹2 crores.

c. Medium Service Enterprises: The investment in equipment is more than ₹2 crores but does not exceed ₹5 crores.

8.11 Public Sector and Private sector banks

Public Sector Banks

Public sector bank is a bank in which the government holds a major portion of the shares. Say for example, SBI is a public sector bank, the government holding in this bank is 58.60%. Similarly PNB is a public sector bank, the government holds a stake of 58.87%. Usually, in public sector banks, government holdings are more than 50 percent. Public sector banks are classified into two categories: 1. Nationalised Banks 2. State Bank and its Associates.

In case of nationalized banks, the government controls and regulates the functioning of the banking entity.Some examples are SBI, PNB, BOB, OBC, Allahabad Bank etc. However, the government keeps reducing the stake in PSU banks as and when they sell shares. So, to that extent they can also become minority shareholders in these banks. This is in accordance with the privatization policy.

Private Sector Banks

In these banks, most of the equity is owned by private bodies, corporations, institutions or individuals rather than government. These banks are managed and controlled by private promoters.

Of the total banking industry in India, public sector banks constitute 72.9% share while the rest is covered by private players. In terms of the number of banks, there are 27 public sector banks and 22 private sector banks.As part of its differentiated banking regime, RBI, the apex banking body, has given license to Payments Bank and Small Finance Banks (SFBs). This is an attempt to boost the government's Financial Inclusion drive. (But, there may be other problems).

As a result, Airtel Payments Bank and Paytm Payments Bank Limited have come up. How far these banks would help the poor people is not known.

Top 10 Private Sector Banks In India



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8.12 Nationalisation of Banks

After Independence, the Government of India adopted planned economic development. For this purpose, Five Year Plans came into existence since 1951. The main objective of the economic planning aimed at social welfare. Before Independence commercial banks were in the private sector. These commercial banks failed in helping the Government to achieve social objectives of planning. Therefore, the government decided to nationalize 14 major commercial banks on 19 July 1969. In 1980, again the government took over another 6 commercial banks.

Objectives of Nationalisation

The Government of India nationalized the commercial banks to achieve the following objectives.

1. The main objective of nationalisation was to attain social welfare. Sectors such as agriculture, small and village industries were in need of funds for their expansion and further economic development.
2. Nationalisation of banks helped to curb private monopolies in order to ensure a smooth supply of credit to socially desirable sections.
3. In India, nearly 70% of population lived in rural areas. Therefore it was needed to encourage the banking habit among the rural population.

Nationalization

1969 14 banks with deposits above ₹. 50 crores were Nationalized.
1980 6 banks with deposits above ₹. 200 crores were Nationalized

19 July 1969
1. Allahabad Bank
2. Bank of Baroda
3. Bank of Maharashtra
4. Canara Bank
5. Central Bank of India
6. Dena Bank
7. Indian Bank
8. Indian Overseas Bank
9. Punjab National Bank
10. Syndicate Bank
11. Union Bank
12. United Bank of India
13. UCO Bank
14. Bank of India

15 April 1980
1. Andhra Bank
2. Corporation Bank
3. New Bank of India
4. Oriental Bank of Commerce
5. Punjab & Sindh Bank
6. Vijaya Bank



Merger of Banks

1. Oriental Bank of Commerce and United Bank of India are merged with Punjab National Bank
2. Syndicate Bank is merged with Canara Bank
3. Andhra Bank and Corporation Bank are merged with Union Bank of India
4. Allahabad Bank is merged with Indian Bank

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4. Nationalisation of banks was required to reduce the regional imbalances where the banking facilities were not available.
5. Before Independence, the numbers of banks were certainly inadequate. After nationalization, new bank branches were opened in both rural and urban areas.
6. Banks created credit facilities mainly to the agriculture sector and its allied activities after nationalization.

After New Economic Policy 1991, the Indian banking industry has been facing new horizons of competitions, efficiency and productivity. With all these developments people in villages and slums depend largely on local money lenders for their credit needs. This is unfortunate.

8.13 Performance of India's Five Year Plans

Economic planning is the process in which the limited natural resources are used skillfully so as to achieve the desired goals. The concept of economic planning in India or five year plan is derived from Russia (then USSR). India has launched 12 five year plans so far. Twelfth five year plan was the last one. The government of India has decided to stop the launching of five year plans and it was replaced by NITI Aayog.

First Five Year Plan (1951-1956)

- It was based on the Harrod-Domar Model.
- Its main focus was on the agricultural development of the country.
- This plan was successful and it achieved the GDP growth rate of 3.6% (more than its target)

Second Five Year Plan (1956-1961)

- It was based on the P.C. Mahalanobis Model.
- Its main focus was on the industrial development of the country.
- This plan was successful and it achieved the growth rate of 4.1%

Third Five Year Plan (1961-1966)

- This plan was called 'GadgilYojana' also.
- The main target of this plan was to make the economy independent and to reach self propelled position or take off.
- Due to Indo -China war, this plan could not achieve its growth target of 5.6%

Plan Holiday (1966-1969)

- The main reason behind the plan holiday was the Indo-Pakistan war & failure of third plan.
- During this period, annual plans were made and equal priority was given to agriculture, its allied sectors and the industry sector.

Fourth Five Year Plan (1969-1974)

- There are two main objectives of this plan i.e. growth with stability and progressive achievement of self reliance.

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- This plan failed and could achieve growth rate of 3.3% only, against the target of 5.7%.

Fifth Five Year Plan (1974-1979)

- In this plan top priority was given to agriculture, next came industry and mines.
- Overall this plan was successful, which achieved the growth rate of 4.8% against the target of 4.4%.
- The draft of this plan was prepared and launched by D.P. Dhar. This plan was terminated in 1978.

Rolling Plan

This plan was started with an annual plan for 1978-79 and as a continuation of the terminated Fifth Five year's plan.

Sixth Five Year Plan (1980-1985)

- The basic objective of this plan was poverty eradication and technological self reliance. Poverty eradication (GARIBI-HATAO) was the motto.
- It was based on investment plan.
- Its growth target was 5.2% but it achieved 5.7%.

Seventh Five Year Plan (1985-1990)

- Objectives of this plan included the establishment of the self sufficient economy and opportunities for productive employment.
- For the first time, due to the pressure from private sector the private sector got the priority over public sector.
- Its growth target was 5.0% but it achieved 6.0%.

Annual Plans

Eighth five year Plan could not take place due to volatile political situation at the centre. So two annual programmes are formed in 1990-91& 1991-92.

Eighth Five Year Plan (1992-1997)

- In this plan top priority was given to the development of human resources i.e. employment, education and public health.
- During this plan, New Economic Policy of India was introduced.
- This plan was successful and got annual growth rate of 6.8% against the target of 5.6%.

Ninth Five Year Plan (1997-2002)

- The main focus of this plan was "growth with justice and equity".
- This plan failed to achieve the growth target of 7% and Indian economy grew only at the rate of 5.6%.

Tenth Five Year Plan (2002-2007)

- This plan aimed to double the per capita income of India in the next 10 years.
- It aimed to reduce the poverty ratio to 15% by 2012.

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- Its growth target was 8.0% but it achieved only 7.2%.

Eleventh Five Year Plan (2007-2012)

- Its main theme was "faster and more inclusive growth".
- Its growth rate target was 8.1% but it achieved only 7.9%

Twelfth Five Year Plan (2012-2017)

- Its main theme is "Faster, More Inclusive and Sustainable Growth".
- Its growth rate target is 8%.

Here it can be concluded that since the Indian Independence the five year plans of India played a very prominent role in the economic development of the country. These plans had guided the Government as to how it should utilise scarce resources so that maximum benefits can be gained. It is worthy to mention here that Indian Government adopted the concept of five year plans from Russia.

NITI Aayog

The Planning Commission has been replaced by the NITI Aayog on 1st January, 2015. NITI (National Institution for Transforming India) Aayog will monitor, coordinate and ensure implementation of the accepted sustainable development goals. NITI Aayog serves as a knowledge hub and monitors progress in the implementation of policies and programmes of the Government of India. It includes the matters of national and international importance on the economic front, dissemination of best practices from within the country and from other nations, the infusion of new policy ideas and specific issue-based support. In order to understand the achievements of the NITI Aayog, researches need to be done then and there.

8.14 Development Indicators

8.14.1 Human Development Index (HDI)

United Nations Development Programme has been publishing Human Development Report annually since 1990. HDI helped the government to the real uplifting of standard of living of the people.

Human Development Index (HDI)

HDI was developed by the Pakistani Economist Mahbub ul Haq and the Indian Economist Amartya Kumar Sen in 1990 and was published by the United Nations Development Programme (UNDP). It is constructed based on Life Expectancy Index, Education Index and GDP Per Capita.

HDI is based on the following three indicators

1. Longevity is measured by life expectancy at birth,

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2. Educational attainments,
3. Standard of living, measured by real GDP per capita (PPP$).

Before calculating HDI, the fixed minimum and maximum values of each indicator are chosen.

The performance in each dimension is expressed as a value between 0 and 1 by applying the following formula

Dimension Index = (Actual value – Minimum value) / (Maximum value - Minimum value)

According to Planning Commission's National Human Development Report 2011, HDI has improved significantly between 1980 and 2011. That is, The HDI went up from 0.302 in 1981 to 0.472 score in 2011.

As per latest Human Development Report (2016) by the United Nations Development Programme (UNDP), India has been ranked 131st out of 188 countries. Out of 188 countries, India lies in Medium Human Development bracket. The other nations such as Bangladesh, Bhutan, Pakistan, Kenya, Myanmar and Nepal attained the medium human development. The HDR 2016 stated that regional disparities in education, health and living standards within India have caused India's downfall to 27 % on HDI score. India's HDI rank value in 2015 stood at 0.624, which had increased from 0.580 in 2010. India's rank in 2014 was 131.

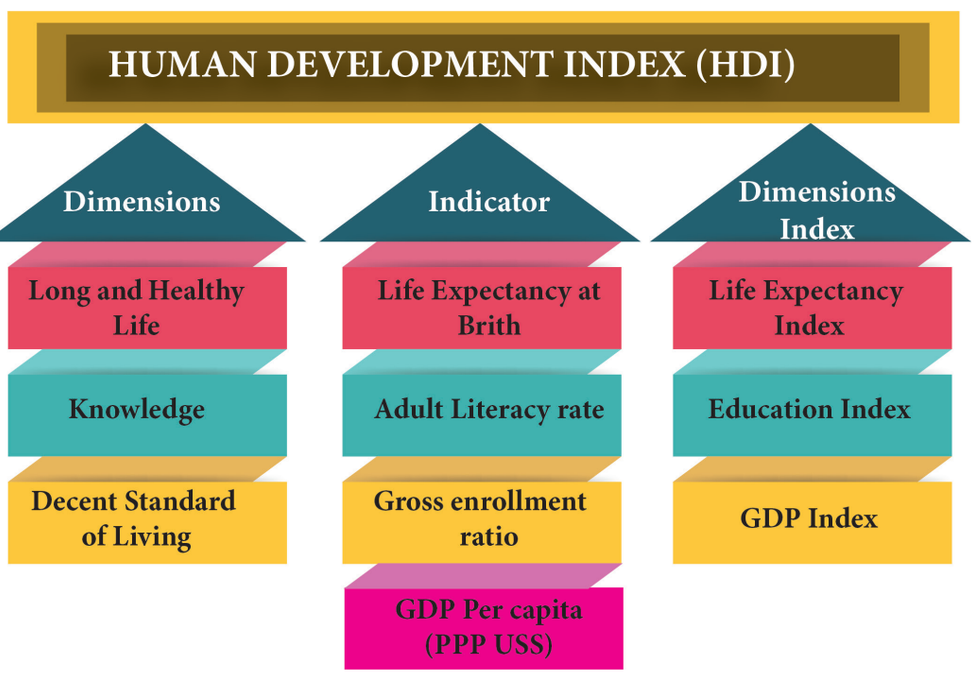
Top three countries of HDI

Norway (0.949)

Australia (0.939)

Switzerland (0.939)

Biswajeet Guha has stated that the calculation of HDI neglected many important aspects of human development. He has created four indices of HDI as HDI_1, HDI_2, HDI_3, and HDI_4. HDI_1 is based on UNDP methodology as given in Human



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Development Report. He has enlarged the scope of HDI by adding three more dimensions such as quality of life, poverty eradication, and urbanization.

Various countries including India are continuously making efforts to improve and enlarge the scope of available statistical information.

8.14.2 Physical Quality of Life Index (PQLI)

Morris D Morris developed the Physical Quality of Life Index (PQLI). The PQLI is a measure to calculate the quality of life (well being of people of a country). For this, he included three indicators such as life expectancy, infant mortality rate and literacy rate. A scale of each indicator ranges from the number 1 to 100.

Number 1 represents the worst performance by any country. 100 is the best performance. For example, in case of life expectancy, the upper limit of 100. This was assigned to 77 years which was achieved by Sweden in 1973. The lower limit of 1 was assigned to 28 years which was achieved by Guinea-Bissau in 1960.

The main difference between the two is the inclusion of income in HDI and exclusion of income from PQLI. HDI represents both physical and financial attributes of development and PQLI has only the physical aspects of life.

8.15 Conclusion

To conclude, the British were more focused on the money from Indians than good governance. Some positive things happened during British Rule. They eradicated systems like 'sati', introduced railway services, English language and education, infrastructure and basic principle of capitalist economy. After Independence, the Government of India formulated many policies with the help of Five year plans to achieve the growth target in various sectors. Among the other things, the major challenges that still continue are: poor health standard, female foeticide, declining child sex ratio, open defecation, human scavenging, social & economic inequalities, increasing slumming, urban congestion and declining qualities of basic environmental resources namely air, land and water.

Glossary

- **Zamindari:** The owner of the land who pays the land revenue to the Government.
- **Mahalwari:** The collective body usually the villagers which serve as a unit of management.
- **Ryotwari:** The ownership rights of use and control of land were held by the tiller himself.
- **Green Revolution:** The renovation of agricultural practices through modern technology.
- **Public Sector Banks:** A bank in which the government holds a major portion of the shares.
- **Private Sector Banks:** Most of the equity is owned by private bodies, corporations, institutions and individuals rather than government.

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- **Nationalisation:** The process of transferring private assets ownership to government ownership.
- **Human Development Index:** It is a composite statistic of life expectancy, education and per capita income indicators.
- **Physical Quality of Life Index:** It is a measure to calculate the quality of life (well being of people of a country).

MODEL QUESTIONS

Part-A Multiple Choice Questions

1. The arrival of Vasco da Gama in Calicut, India
   - a. 1498
   - b. 1948
   - c. 1689
   - d. 1849

2. In 1614 Sir Thomas Roe was successful in getting permission from
   - a. Akbar
   - b. Shajakan
   - c. Jahangir
   - d. Noorjakhan

3. The power for governance of India was transferred from the East India Company (EIC) to the British crown in
   - a. 1855
   - b. 1858
   - c. 1868
   - d. 1878

4. Ryotwari system was initially introduced in
   - a. Kerala
   - b. Bengal
   - c. Tamil Nadu
   - d. Maharastra

5. First World War started in the year
   - a. 1914
   - b. 1814
   - c. 1941
   - d. 1841

6. When did the Government of India declare its first Industrial Policy ?
   - a. 1956
   - b. 1991
   - c. 1948
   - d. 2000

7. The objective of the Industrial Policy 1956 was ……..
   - a. Develop heavy industries
   - b. Develop agricultural sector only
   - c. Develop private sector only
   - d. Develop cottage industries only

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8. The industry which was de-reserved in 1993 ?

   a. Railways

   b. Mining of copper and zinc

   c. Atomic energy

   d. Atomic minerals

9. The father of Green Revolution in India was .....

   a. M.S. Swaminathan

   b. Gandhi

   c. Visweswaraiah

   d. N.R. Viswanathan

10. How many commercial banks were nationalised in 1969 ?

   a. 10

   b. 12

   c. 14

   d. 16

11. The main objective of nationalisation of banks was .....

   a. Private social welfare

   b. Social welfare

   c. To earn

   d. Industries monopoly

12. The Planning Commission was setup in the year .....

   a. 1950

   b. 1955

   c. 1960

   d. 1952

13. In the first five year plan, The top priority was given to ..... Sector.

   a. Service

   b. Industrial

   c. Agriculture

   d. Bank

14. Tenth Five year plan period was.....

   a. 1992-1997

   b. 2002-2007

   c. 2007-2012

   d. 1997-2002

15. According to HDR (2016), India ranked ..... out of 188 countries.

   a. 130 **b.** 131

   c. 135 **d.** 145

16. Annual Plans formed in the year .....

   a. 1989-1991

   b. 1990-1992

   c. 2000-2001

   d. 1981-1983

17. The Oldest large scale industry in India

   a. cotton **b.** jute

   c. steel **d.** cement

18. Human development index (HDI) was developed by

   a. Jawaharlal Nehru

   b. M.K. Gandhi

   c. Mahbub ul Haq and Amartiya Sen

   d. Tagore

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19. The main theme of the Twelth Five Year Plan

a. faster and more inclusive growth

b. growth with social Justice

c. socialistic pattern of society

d. faster, more inclusive and sustainable growth

20. The PQLI was developed by .....

a. Planning Commission

b. Nehru

c. Morris

D Biswajeet

Part-A Answers

1	2	3	4	5	6	7	8	9	10
a	c	b	c	a	c	a	b	a	c
11	12	13	14	15	16	17	18	19	20
b	a	c	b	b	b	a	c	d	c

Part-B Answer the following questions in one or two sentences.

21. What are the Phases of colonial exploitation of India?

22. Name the different types of land tenure existed in India before Independence.

23. State the features that distinguish a land tenure system from other system.

24. List out the weaknesses Green Revolution.

25. What are the objectives of Tenth five year plan ?

26. What is the difference between HDI and PQLI ?

27. Mention the indicators which are used to calculate HDI.

Part-C Answer the following questions in one paragraph.

28. Explain the Period of Merchant Capital.

29. The Handicrafts declined in India in British Period. Why?

30. Elucidate the different types of land tenure system in colonial India.

31. State the reasons for nationalization of commercial banks.

32. Write any three objectives of Industrial Policy 1991.

33. Give a note on Twelfth Five Year Plan.

34. What is PQLI ?

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Part-D Answer the following questions in about a page

35. Discuss the Indian economy during British Period.
36. Explain the role of SSIs in economic developmet?
37. Explain the objectives of nationalization of commercial banks.
38. Describe the performance of five year plans in India.

ACTIVITY

1. To know the value of freedom, students can collect pictures of places like Jalian Walapak, Meerut, Thandi and photos of freedom fighters.
2. Display the demonstration effect of present Indians in culture, dressing and life style to emphasize the Swadhesi.

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CHAPTER

9 Development Experiences in India

"Reform, Perform, Transform"

Learning Objective

1 To understand the reforms introduced in the recent years.

9.1 Introduction

At the time of Independence in 1947, India was a typically backward economy. Owing to poor technological and scientific capabilities, industrialization was limited and lop-sided. Agricultural sector exhibited features of feudal and semi-feudal institutions, resulting into low productivity. Means of transport and communications were underdeveloped. Educational and health facilities were grossly inadequate and social security measures were virtually non-existent. In brief, the country suffered from the twin problems of rampant poverty and widespread unemployment, both resulting in low standard of living.

The year 1991 is an important landmark in the economic history of post-independent India. The country went through a severe economic crisis in the form of serious Balance of Payments problem. Indian economy responded to the crisis by introducing a set of policies known as Structural Reforms. These policies were aimed at correcting the weaknesses and rigidities in the various sectors of the economy such as Industry, Trade, Fiscal and Agriculture.

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9.2 Meaning of Liberalization, Privatization and Globalization (LPG)

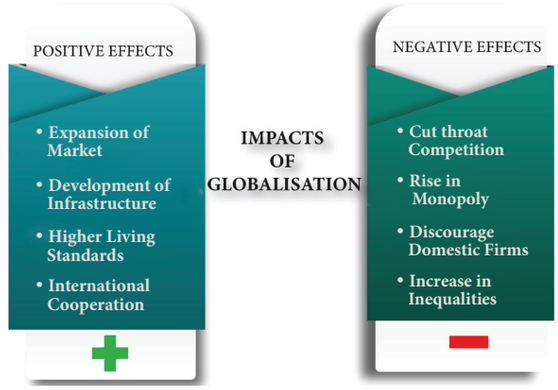


The triple pillars of New Economic Policy are Liberalization, Privatization and Globalization (LPG)

Liberalization: Liberalization refers to removal or relaxation of governmental restrictions in all stages in industry. Delicensing, decontrol, deregulation, subsidies (incentives) and greater role for financial institutions are the various facets of liberalization.

Privatization: Privatization means transfer of ownership and management of enterprises from public sector to private sector. Denationalization, disinvestment and opening exclusive public sector enterprises to private sector are the gateways to privatization.

Globalization: Globalization refers to the integration of the domestic (Indian) economy with the rest of the world. Import liberalization through reduction of tariff and non-tariff barriers, opening the doors



to Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI) are some of the measures towards globalization.

9.3 Arguments in favour of LPG

a. Liberalization was necessitated because various licensing policies were said to be deterring the growth of the economy.

b. Privatization was necessitated because of the belief that the private sector was not given enough opportunities to earn more money.

c. Globalization was necessitated because today a developed country can grow without the help of the under developed countries. Natural and human resources of the developing countries are exploited by the developed countries and the developing economies are used as market for the finished goods of the developed countries. The surplus capital of the developed countries are invested in backward economies. Obsolute and outdated technologies of the developed

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countries can be easily sold to poor under developed countries. Ultimately, the rich countries can grow further at the cost of developing economies.

9.4 Arguments against LPG

a. Liberalization measures, when effectively enforced, favour an unrestricted entry of foreign companies in the domestic economy. Such an entry prevents the growth of the local manufacturers.

b. Privatization measures favour the continuance of the monopoly power. Only the powerful people can sustain in business markets. Social justice cannot be easily established and maintained. As a result, the disparities tend to widen among people and among regions.

c. As globalization measures tend to integrate all economies of the world and bringing them all under one umbrella; they pave the way for redistribution of economic power at the world level. Only the already well-developed countries are favoured in this process and the welfare of the less-developed countries will be neglected. The economic crisis of the developed countries are easily spread to the developing economies through trade.

The following are the major changes after 1991:

1. Foreign exchange reserves started rising.
2. There was a rapid industrialization.
3. The pattern of consumption started improving (or deteriorating).
4. Infrastructure facilities such as express highways, metro rails, flyovers and airports started expanding (but the local people were thrown away).

The benefits of this growth in some sectors have not reached the marginalized sections of the community. Moreover, the process of development has generated serious social, economic, political, demographic and ecological issues and challenges. Development brings benefits, but which section gets this benefit depends on socio-economic structure of the society.

Despite all these initiatives in the Indian economy, a large section of the people of India continue to face basic economic problems such as poverty, unemployment, discrimination, social exclusion, deprivation, poor healthcare, rising inflation, agricultural stagnation, food insecurity and labour migration. However, for these problems, Government policies alone cannot be blamed. As new institutional economists suggest, the values, believes, norms etc. of the individuals also matter.

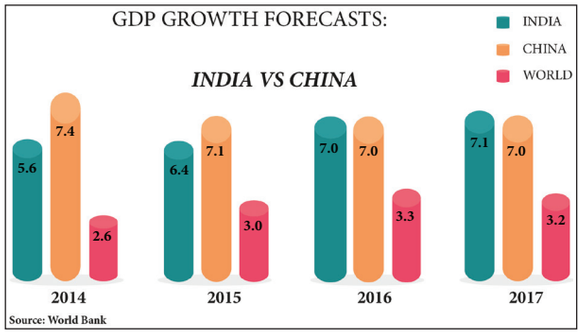
Disinvestment

Disinvestment means selling of government securities of Public Sector Undertakings (PSUs) to other PSUs or private sectors or banks. This process has not been fully implemented.

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9.5 Relative Position of Indian Economy

(This discussion is suitable for a particular period only, there may be changes afterwards)



- According to International Monetary Fund, World Economic Outlook (Ocoter-2016), GDP (nominal) of India in 2016 at current prices was $2,251 billion. India contributed 2.99% of total world's GDP in exchange rate basis. India shared 17.5 percent of the total world population and 2.4 percent of the world surface area. India was now 7th largest economy of the world in 2016.
- India was at 3rd position after China and Japan among Asian countries. India shared 8.50% of total Asia's GDP (nominal) in 2016.

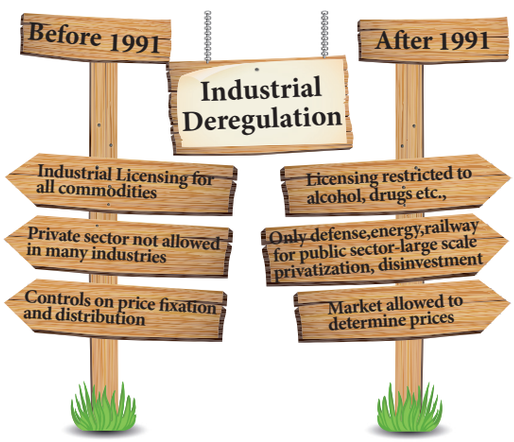
9.6 Industrial Sector Reforms

The Prime Minister of India announced the new industrial policy on July 24, 1991. The new policy radically liberalized the industrial policy itself and de-regulated the industrial sector substantially. The primary objectives of the industrial policy were to promote major industries from the clutches of bureaucrats, to abolish restrictions on foreign direct investment, to liberate the indigenous enterprise from the restrictions of MRTP Act, to maintain a sustained growth in productivity and employment and also to achieve international competitiveness.

Important Initiatives by the Government towards Industrial Policy

The policy has brought changes in the following aspects of industrial regulation:

1. Industrial delicensing
2. Dereservation of the industrial sector
3. Public sector policy (dereservation and reform of PSEs)
4. Abolition of MRTP Act
5. Foreign investment policy and foreign technology policy.



1. **Industrial delicensing policy:** the most important objective of the new industrial policy of 1991 was the

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end of the industrial licensing or the license raj or red tapism. Under the industrial licensing policies, private sector firms had to secure licenses to start an industry.

2. **Dereservation of the industrial sector** Previously, the public sector was given reservation especially in the capital goods and key industries. Under industrial deregulation, most of the industrial sectors were opened to the private sector as well. Under the new industrial policy, only three sectors viz., atomic energy, mining and railways will continue as reserved for public sector. All other sectors have been opened for private sector participation.

3. **Reforms related to the Public sector enterprises:** Reforms in the public sector were aimed at enhancing efficiency and competitiveness of the sector. The government identified strategic and priority areas for the public sector to concentrate. Loss making PSUs were sold to the private sector.

4. **Abolition of MRTP Act:** The New Industrial Policy of 1991 has amended the Monopoly and Restrictive Trade Practices Act. In 2010, the Competition Commission has emerged as the watchdog in monitoring competitive practices in the economy.

   The policy caused big changes including emergence of a strong and competitive private sector and a sizable number of foreign companies in India.

5. **Foreign investment policy**: Another major feature of the economic reform was red carpet welcome to foreign investment and foreign technology. This measure has enhanced the industrial competition and improved business environment in the country. Foreign investment including FDI and FPI were allowed. In 1991, the government announced a specified list of high-technology and high-investment priority industries wherein automatic permission was granted for foreign direct investment (FDI) upto 51 percent foreign equity. The limit was raised to 74 percent and subsequently to 100 percent for many of these industries. Moreover, many new industries have been added to the list over the years.

   Foreign Investment Promotion Board (FIPB) has been set up to negotiate with international firms and approve foreign direct investment in select areas.

9.7 Impact of LPG on Agricultural Sector Reforms

Since the inception of economic reforms, Indian economy has achieved a remarkable rate of growth in industry and service sector. However, this growth process bypassed the agricultural sector, which showed sharp deceleration in the growth rate (3.62 percent during 1984/85 – 1995/96 to 1.97 percent in 1995/96 – 2004/05). The sector has recorded wide variations in yield and

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productivity and there was a shift towards cash crop cultivation. Moreover, agricultural indebtedness pushed several farming households into poverty and some of them resorted to extreme measures like suicides.

9.7.1 Crop Insurance

Agriculture in India is highly prone to risks like droughts and floods. It is necessary to protect the farmers from natural calamities and ensure their credit eligibility for the next season. For this purpose, the Government of India introduced many agricultural schemes throughout the country.



The Pradhan Mantri Fasal Bima Yojana (Prime Minister's Crop Insurance Scheme) was launched on 18 February 2016.

It envisages a uniform premium of only 2 percent to be paid byfarmers forKharif crops and 1.5 percent for Rabi crops. The premium for (annual) commercial and horticultural crops will be 5 percent.

9.7.2 Cold Storage

India is the largest producer of fruits and second largest producer of vegetables in the world. In spite of that per capita availability of fruits and vegetables is quite low because of post harvest losses which account for about 25% to 30% of production. Besides, quality of a sizable quantity of produce also deteriorates by the time it reaches the consumer. Most of the problems relating to the marketing of fruits and vegetables can be traced to their perishability. Perishability is responsible for high marketing costs, market gluts, price fluctuations and other similar problems. In order to overcome this constraint, the Government of India and the Ministry of Agriculture promulgated an order known as "Cold Storage Order, 1964" under Section 3 of the Essential Commodities Act, 1955. However, the cold storage facility is still very poor and highly inadequate.

9.7.3 Post Harvest measures

The annual value of harvest and post-harvest losses of major agricultural produce at national level was of the order of ₹92,651 crores, calculated using production data of 2012-13 at 2014 and wholesale prices, estimated by the Indian Council of Agricultural Research (ICAR).

Table 9.1 Food Items Waste (%)

Crops	Cumulative wastages (%)
Cereals	5-6
Pulses	6 – 8
Oil seeds	3-10
Fruits &Vegetables	5-16
Milk	1
Fisheries (in land)	5
Fisheries (Marine)	10
Meat	3
Poultry	7

Source: Ministry of Food Processing Industries, GoI, 2016

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Kisan Credit Card Scheme

A Kisan Credit Card (KCC) is a credit delivery mechanism that is aimed at enabling farmers to have quick and timely access to affordable credit. It was launched in 1998 by the Reserve Bank of India and NABARD. The scheme aims to reduce farmer's dependence on the informal banking sector for credit – which can be very expensive and suck them into a debt spiral. The card is offered by cooperative banks, regional rural banks and public sector banks. Based on a review of the working of the KCC, the government has advised banks to convert the KCC into a smart card cum debit card.

In order to reduce wastage of agricultural produce and minimize post-harvest losses, the Ministry of Food Processing Industries (MOFPI) has implemented various components of Central Sector Schemes, namely:

Mega Food Parks; Integrated Cold Chain; Value Addition Preservation Infrastructure; Modernization of Slaughter house

Scheme for Quality Assurance; Codex Standards; Research and Development and Other promotional activities.

Further, the GoI extended support to arrest post harvest losses of horticulture and non-horticulture produce and to provide integrated cold chain and preservation infrastructure facilities from the farm gate to the consumer or from the production site to the market since 2008-09. However, the improvement is not visible because it is not substantial.

9.7.4 Agricultural Produce Market Committee

Agricultural Produce Market Committee (APMC) is a statutory body constituted by state government in order to trade in agricultural or horticultural or livestock products.

Functions of APMC

Functions of APMC are:

1. To promote public private partnership in the ambit of agricultural markets.
2. To provide market led extension services to farmer.
3. To bring transparency in pricing system and transactions taking place in market in a transparent manner.
4. To ensure payments to the farmers for the sale of agricultural produce on the same day.
5. To promote agricultural activities.
6. To display data on arrivals and rates of agricultural produce from time to time- in the market prevailing.

9.7.5 Agrarian Crisis after Reforms

a) **High input Costs:** The biggest input for farmers is seeds. Before liberalisation, farmers across the country had access

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to seeds from state government institutions. The institutions produced own seeds and were responsible for their quality and price. With liberalization, India's seed market was opened upto global agribusinesses. Also, following the deregulation many state government institutions were closed down in 2003. These hit farmers doubly hard: seed prices shot up, and fake seeds made an appearance in a big way.

b) **Cutback in agricultural subsidies:** Farmers were encouraged to shift from growing a mixture of traditional crops to export oriented 'cash crops' like chilli, cotton and tobacco. Liberalisation policies reduced the subsidies on pesticide, fertilizer and electricity. As a result prices have increased by 300%. However, the prices of agricultural goods have not increased to that extent.

c) **Reduction of import duties:** With a view to open India's markets, the liberalization reforms also withdrew tariffs and duties on imports. By 2001, India completely removed restrictions on imports of almost 1,500 items including food. As a result, cheap imports flooded the market, pushing prices of crops like cotton and pepper down.

d) **Paucity of credit facilities:** After 1991 the lending pattern of commercial banks, including nationalised bank drastically changed. As a result, loan was not easily avilable and adequate. This has forced the farmers to rely on moneylenders who charge exorbitant rate of interest.

9.8 Trade Reforms:

- **Trade Policy Reforms:** The main features of the new trade policy as it has evolved over the years since 1991 are as follows:
  - **Free imports and exports:** Prior to 1991, in India imports were regulated. From 1992, imports were regulated by a limited negative list. For instance, the trade policy of 1 April 1992 freed imports of almost all intermediate and capital goods. Only 71 items remained restricted. This would affect the domestic industries.
  - **Rationalization of tariff structure and removal of quantitative restrictions:** The Chelliah Committee's Report had suggested drastic reduction in import duties. It had suggested a peak rate of 50 percent. As a first step towards a gradual reduction in the tariffs, the 1991-92 budget had reduced the peak rate of import duty from more than 300 percent to 150 percent. The process of lowering the customs tariffs was carried further in successive budgets. This also affected the domestic industries.

9.8.1 Export and Import Policy

The Government of India, Ministry of Commerce and Industry announced New Foreign Trade Policy on 1st April 2015 for the period of 2015-2020.

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Salient Features of "EXIM POLICY (2015-2020)"

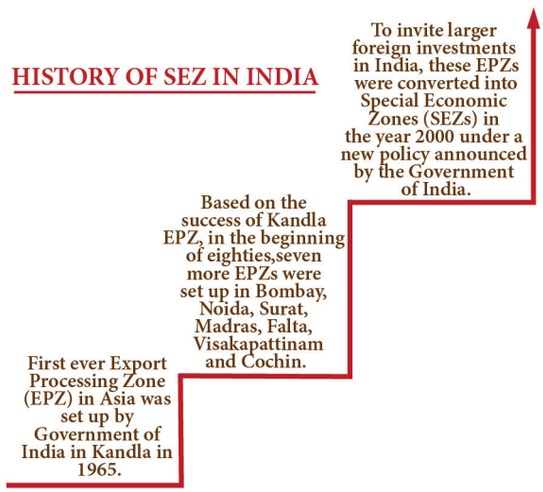
The new EXIM policy has been formulated focusing on increasing in exports scenario, boosting production and supporting the concepts like Make in India and Digital India.

- Reduce export obligations by 25% and give boost to domestic manufacturing supporting the "Make in India" concept.
- As a step to Digital India concept, online procedure to upload digitally signed document by CA/CS/Cost Accountant are developed and further mobile app for filing tax, stamp duty has been developed.
- Repeated submission of physical copies of documents available on Exporter Importer Profile is not required.
- Export obligation period for export items related to defence, military store, aerospace and nuclear energy to be 24 months.
- EXIM Policy 2015-2020 is expected to double the share of India in World Trade from present level of 3% by the year 2020. This appears to be too ambitious.

9.8.2 Special Economic Zones

With a view to overcome the shortcomings experienced on account of the multiplicity of controls and clearances, absence of world-class infrastructure, and an unstable fiscal regime and with a view to attract larger foreign investments in India, the Special Economic Zones (SEZs) Policy was announced in April 2000.

As part of the economic reforms, the system of taking over land by the government for commercial and industrial purposes was introduced in the country. As per the Special Economic Zones Act of 2005, the government has so far notified about 400 such zones in the country. Since the SEZ deprives the farmers of their land and livelihood, it is harmful to agriculture. In order to promote export and industrial growth in line with globalisation the SEZ was introduced in many countries.



India was one of the first in Asia to recognize the effectiveness of the Export Processing Zone (EPZ) model in promoting exports, with Asia's first EPZ set up in Kandla in 1965. The broad range of SEZ covers free trade zones, export processing zones, industrial parks, economic and technology development zones, high-tech zones, science and innovation parks, free ports, enterprise zones, and others.

Major Objectives of SEZs

1. To enhance foreign investment, especially to attract foreign direct

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investment (FDI) and thereby increasing GDP.

2. To increase shares in Global Export (International Business).
3. To generate additional economic activity.
4. To create employment opportunities.
5. To develop infrastructure facilities.
6. To exchange technology in the global market.

Main Characteristics of SEZ

a. Geographically demarked area with physical security
b. Administrated by single body/ authority
c. Streamlined procedures
d. Having separate custom area
e. Governed by more liberal economic laws.
f. Greater freedom to the firms located in SEZs. As a result, they need not respect the Government's rules and regulations. The social and environmental impacts were disastrous.

9.9 Fiscal Reforms

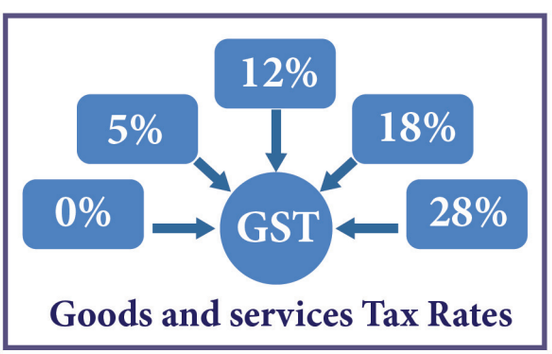
A key element in the stabilization effort was to restore fiscal discipline. It means reduction of fiscal deficit to the extent of just 3% of GDP, as suggested by Fund Bank Policies. In this way, the budget aimed at containing government expenditure and augmenting revenues; reversing the downtrend in the share of direct taxes to total tax revenues and curbing conspicuous consumption. Some of the important policy initiatives introduced for correcting the fiscal imbalance were: reduction in fertilizer subsidy, abolition of subsidy on sugar and disinvestment of a part of the government's equity holdings in select public sector undertakings. Gradually expenditures on welfare measures were reduced; tasks on corporate sectors were reduced; and tasks on poor people were increased.

9.9.1 Goods and Services Tax (GST)

Goods and Services Tax (GST) is defined as the tax levied when a consumer buys a good or service. It is proposed to be a comprehensive indirect tax levied on manufacture, sale and consumption of goods as well as services. GST aims to replace all indirect taxes levied on goods and services by the Indian Central and State governments. GST would eliminatie the cascading effect of taxes on the production and distribution of goods and services. It is also a "one-point tax" Unlike VAT which was a multipoint tax.

The Goods and Service Tax Act was passed in the Parliament on 29th March 2017. The Act came into effect on 1st July 2017.*The motto is one nation, one market, one tax.*

Current GST Rates in India



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Advantages of GST

- Removing cascading tax effect
- Single point tax
- Higher threshold for registration
- Composition scheme for small business
- Online simpler procedure under GST
- Defined treatment for e-ecommerce
- Increased efficiency in logistics
- Regulating the unorganized sector

9.10 Monetary and Financial Sector Reforms

Monetary reforms aimed at doing away with interest rate distortions and rationalizing the structure of lending rates.

The new policy tried in many ways to make the banking system more efficient. Some of the measures undertaken were:

a. **Reserve Requirements**: Reduction in statutory liquidity ratio (SLR) and the cash reserve ratio (CRR) were recommended by the Narasimham Committee Report, 1991. It was proposed to cut down the SLR from 38.5 percent to 25 percent within a time span of three years. Similarly, it was proposed that the CRR be brought down to 3 to 5% over a period of four years.

b. **Interest Rate Liberalisation:** Earlier, RBI controlled (i) the interest rates payable on deposits, (ii) the interest rates which could be charged for bank loans.

c. Greater competition among public sector, private sector and foreign banks and elimination of administrative constraints.

d. Liberalisation of bank branch licensing policy in order to rationalize the existing branch network.

e. Banks were given freedom to relocate branches and open specialized branches

f. Guidelines for opening new private sector banks.

g. New accounting norms regarding classification of assets and provisions of bad debt were introduced in tune with the Narasimham Committee Report.

9.11 Conclusion

There is no doubt that the Indian economy recorded ample achievements in some sectors after new economic policy. If the size of an economy provides the first impression of a country's political and economic strength, then India has indeed grown since 1991. In dollar terms, India's GDP crossed the $2-trillion mark in 2015-16. Currently, the country is ranked ninth in the world in terms of nominal GDP. Once India was rebuked for its "Hindu rate of growth", a term used by Rajkrishna to refer to low rate of economic growth. The GDP growth rate of India is very much appreciated. This growth is also due to changes in accounting system. That is why the increased GDP growth rate has failed to alleviate the miseries of the common people and to reduce the socio, economic and environmental imbalances. The basic problems of unemployment, poverty,ill-health and inequalities remain unsolved.

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Glossary

Liberalization	Liberalization refers to the relaxation of the government restriction usually in the area of social and economic policies.
Privatization	It refers to the participation of private entities in businesses and services and transfer of ownership from public sector to private sector as well.
Globalization	Globalization stands for the consolidation of the various economies of the world.
Disinvestment	The action of a government selling or liquidating public asset.
Industrial delicensing	Abolishing government control by removing the earlier restriction and licenses.
Foreign Direct Investment	An investment in a business by an investor from another country.
Foreign Private Investment	It comprises Foreign Direct Investment and Foreign Portfolio Investment.
Cold storage	A storage of agricultural commodities in a cold place for preservation.
SEZ	It is an area in which business and trade laws are different from rest of the country mainly aiming at increasing trade, investment and job creation.
SLR	Statutory Liquidity Ratio refers to the amount that the commercial banks require to maintain in the form of cash or gold or government approved securities before providing credit to the customers.

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MODEL QUESTIONS

Part-A Multiple Choice Questions

1. Which of the following is the way of Privatisation?



   a. Disinvestment
   b. Denationalization
   c. Franchising
   d. All the above

2. Countries today are to be _____ for their growth.
   a. Dependent
   b. Interdependent
   c. Free trade
   d. Capitalist

3. The Arguments against LPG relate to _____
   a. Economic growth
   b. More investment
   c. Disparities among people and regions
   d. Modernization

4. Expansion of FDI _____
   a. Foreign Private Investment
   b. Foreign Portfolio
   c. Foreign Direct Investment
   d. Forex Private Investment

5. India is the largest producer of _____in the world.
   a. fruits
   b. gold
   c. petrol
   d. diesel

6. Foreigninvestmentincludes_____
   a. FDI only
   b. FPI and FFI
   c. FDI and FPI
   d. FDI and FFI

7. The Special Economic Zones policy was announced in _____
   a. April 2000
   b. July 1990
   c. April 1980
   d. July 1970

8. Agricultural Produce Market Committee is a _____
   a. Advisory body
   b. Statutory body
   c. Both a and b
   d. non of these above

9. Goods and Services Tax is _____
   a. a multi point tax
   b. having cascading effects
   c. like Value Added Tax
   d. a single point tax with no cascading effects.

10. The New Foreign Trade Policy was announced in the year_____
   a. 2000
   b. 2002
   c. 2010
   d. 2015

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11. Financial Sector reforms mainly related to _____

a. Insurance Sector

b. Banking Sector

c. Both a and b

d. Transport Sector

12. The Goods and Services Tax Act came in to effect on _____

a. 1st July 2017

b. 1st July 2016

c. 1st January 2017

d. 1st January 2016

13. The new economic policy is concerned with the following

a. foreign investment

b. foreign technology

c. foreign trade

d. all the above

14. The recommendation of Narashimham Committee Report was submitted in the year_____

a. 1990

b. 1991

c. 1995

d. 2000

15. The farmers have access to credit under Kisan credit card scheme through the following

a. Co-operative banks

b. RRBs

c. Public sector banks

d. All the above

16. The Raja Chelliah Committee on Trade Policy Reforms suggested the peak rate on import duties at

a. 25%

b. 50%

c. 60%

d. 100%

17. The first ever SEZ in India was set up at

a. Mumbai

b. Chennai

c. Kandla

d. Cochin

18. 'The Hindu Rate of Growth' coined by Raj Krishna refers to

a. low rate of economic growth

b. high proportion of Hindu population

c. Stable GDP

d. none

19. The highest rate of tax under GST is _____ (as on July1, 2017)

a. 18%

b. 24%

c. 28%

d. 32%

20. The transfer of ownership from public sector to private sector is known as _____.

a. Globalization

b. Liberalization

c. Privatization

d. Nationalization

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Part-A Answers

1	2	3	4	5	6	7	8	9	10
d	b	c	c	a	c	a	b	d	d
11	12	13	14	15	16	17	18	19	20
c	a	d	b	d	b	c	a	c	c

Part-B Answer the following questions in one or two sentences.

21. Why was structural reform implemented in Indian Economy?

22. State the reasons for implementing LPG.

23. State the meaning of Privatization.

24. Define disinvestment

25. Write three policy initiatives introduced in 1991 – 92 to correct the fiscal imbalance.

26. State the meaning of Special Economic Zones.

27. State the various components of Central government schemes under post - harvest measures.

Part-C Answer the following questions in one paragraph.

28. How do you justify the merits of Privatisation?

29. What are the measures taken towards Globalization?

30. Write a note on Foreign investment policy?

31. Give short note on Cold storage.

32. Mention the functions of APMC.

33. List out the features of new trade policy.

34. What is GST? Write its advantages.

Part-D Answer the following questions in about a page

35. Discuss the important initiatives taken by the Government of India towards Industrial Policy.

36. Explain the objectives and characteristics of SEZs.

37. Describe the salient features of EXIM policy (2015 – 2020)

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ACTIVITY

1. Collect various bills from the neighbouring store and find out the Nature of Product sold and GST rate

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CHAPTER

10 Rural Economy

U6ROA

'India Lives in Villages' – Mahatma Gandhi

Learning Objectives

1. To understand the features of rural economy and to highlight the need to develop rural areas, and
2. To bring into the light the problems of rural villages and to familiarise the initiatives undertaken.

10.1 Introduction

Rural Economics deals with the application of economic principles in understanding and developing rural areas. In general, rural areas are geographical areas located outside towns and cities. According to the Census of India, the basic unit for rural areas is the revenue village. Rural economy refers to villages, and rural community refers to people living in villages. Rural areas have problems like backwardness of agriculture, low income , low employment opportunities, poverty, low infrastructural development, low illiteracy, low labour



productivity, lower prices of agricultural products, surplus labour force, larger population, high level of migration and high dependency on natural resources and nature. According to the 2011 Population

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Census, there are 6,40,867 villages in India and 68.84 percent of the 121crore total population live in rural areas.

10.2 Features of Rural Economy

Main characteristics of rural economy are:

1. **Village is an Institution**: The Village is a primary institution and it satisfies almost all the needs of the rural community. The rural people have a feeling of belongingness and a sense of unity towards each other.
2. **Dependence on Agriculture:** The rural economy depends much on nature and agricultural activities. Agriculture and allied activities are the main occupation in rural areas.
3. **Life of Rural People**: Lifestyles in villages are very simple. Public services like education, housing, health and sanitation, transport and communication, banking, roads and markets are limited and unavailable. Rural people rely much on faith, superstitions and traditional cultural practices. The standards of living of majority of rural people are poor and pitiable. In terms of methods of production, social organization and political mobilization, rural sector is extremely backward and weak. In recent years, the incidence of alcohol drinking has gone up.
4. **Population Density**: Population density, measured by number of persons living per sq. km is very low and houses are scattered in the entire villages.
5. **Employment:** There exists unemployment, seasonal unemployment and underemployment in rural areas. Unemployment refers to a the situation where people who have willingness and ability to work but are not getting employed. Underemployment also called disguised unemployment is the situation of people being employed in excess of the requirement. Disguised unemployment is a situation Where more people no work but no increase in production. Both the situations are common in rural areas.
6. **Poverty**: Poverty is a condition where the basic needs of the people like food, clothing and shelter are not being met. According to the 2011-12 estimates, About 22 crores of people in rural areas are poor and live below the poverty line.
7. **Indebtedness:** People in rural areas are highly indebted owing to poverty and underemployment, lack of farm and non-farm employment opportunities, low wage employment, seasonality in production, poor marketing network etc. A famous British writer Sir Malcolm Darling (1925) stated that 'An Indian farmer is born in debt, lives in debt, dies in debt and bequeaths debt'. Since formal loan facilities are not available to the villagers, they depend on local money lenders who, like a parasite, squeeze the villagers. Hence the villagers commit suicide frequently.
8. **Rural Income**: The income of the rural people is constrained as the rural economy is not sufficiently vibrant to provide them with jobs or self – employment opportunities.

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Large proportion of labourers and skilled persons are underemployed and the scope for increasing their income is limited.

9. **Dependency:** Rural households are largely dependent on social grants and remittances from family members working in urban areas and cities.

10. **Dualism**: Dualism means the co-existence of two exteremely different features like developed and underdeveloped, organised and unorganised, traditional and modern, regulated and unregulated, poor and rich, skilled and unskilled and similar contradicting situations in a region. These characteristics are very common in rural areas.

11. **Inequality:** The distributions of income, wealth and assets are highly skewed among rural people. There are number of historical, social, economic and political reasons behind the existence of inequality. Landlords and landowners dominate the rural activities. Land, livestock and other assets are owned by a few people.

12. **Migration:** Rural people are forced to migrate from villages to urban areas in order to seek gainful employment for their livelihood. This character of the development gives rise to the formation of cities. Enmity and Lack of basic amenities in rural areas also push the people to migrate to urban areas. This is called' double poisoning' by Schumacher, one side villages are empty, on the other side towns are congested. His book '' Small is Beautiful "describes the dangers of the present kind of development.

10.3 Meaning of Rural Development

Rural Development is defined as an overall improvement in the economies and social well being of villagers and the institutional and physical environments in which they live. According to the World Bank, 'Rural Development is a strategy designed to improve the economic and social life of a specific group of people - rural poor'. In short, rural development is a process of improving the rural areas, rural people and rural living.

10.4 Need for Rural Development

Rural development is very urgent in the context of the overall growth and development of Indian economy due to the following reasons.

1. A major share of population lives in rural areas, and their development and contributions are very much supportive for the nation building activities. India cannot be developed by retaining rural as backward.

2. The rural economy supports the urban sectors by way of supplying drinking water, milk, food and raw materials. Hence, the backwardness of the rural sector would be a major impediment to the overall progress of the economy.

3. Improvements in education, health and sanitation in villages can help avoid many urban problems namely, begging, rag picking and road side slumming.

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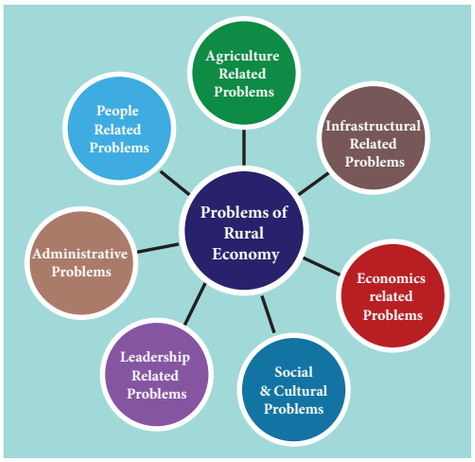
4. Development of agriculture and allied activities are necessary for providing gainful employment in rural areas and improving overall food production.
5. The evils of brain-drain and rural-urban migration can be reduced if rural areas are developed.
6. In order to better utilise the unused and under-utilised resources, there is a need to develop the rural economy.
7. Rural development should minimise the gap between rural and urban areas in terms of the provision of infrastructural facilities. It was called PURA by former President Abdul Kalam.
8. In order to improve the nation's status in the global arena in terms of the economic indicators like Human Development Index (HDI), Women Empowerment Index (WEI), Gender Disparity Index (GDI), Physical Quality of Life Index (PQLI) and Gross National Happiness Index (GNHI) rural economy should be given due attention.

10.5 Problems of Rural Economy

Rural areas are facing number of problems relating to, 1) People, 2) Agriculture, 3) Infrastructure, 4) Economy, 5) Society and Culture, 6) Leadership and 7) Administration.

The problems of rural economy are discussed below.

1. **People Related Problems:** The problems related to individuals and their standard of living consist of illiteracy, lack of technical knowhow, low level of confidence, dependence on sentiments and beliefs etc.
2. **Agriculture Related Problems:** The problems related to agriculture include 1.Lack of expected awareness, knowledge, skill and attitude, 2.Unavailability of inputs, 3.Poor marketing facility, 4.Insufficient extension staff and services, 5.Multidimensional tasks to extension personnel, 6.Small size of land holding, 7.Sub-division and fragmentation of landholdings, 8.Absence of infrastructure to work and stay in rural areas, 9.Primitive technology and low adoption of modern technologies 10. Reduced public investment and absence of role for farmers in fixing the prices for their own products..
3. **Infrastructural Related Problems:** Poor infrastructure facilities like, water, electricity, transport, educational institutions, communication, health, employment, storage facility, banking and insurance are found in rural areas.
4. **Economics related Problems:** The economic problems related to rural areas are: inability to adopt high cost technology, high cost of inputs,



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under privileged rural industries, low income, indebtedness and existence of inequality in land holdings and assets. In fertile areas, a few absentee landlords own large areas and they do not evince greater Interest in improving the performance of agriculture.

5. **Social and Cultural Problems:** Caste system makes villages almost rigid. Dominant Caste in village holds all lands. so they will be the superior class too. Both class and caste exploitation will be at their peaks. Poverty, mal – nourishment, illiteracy, child marriages and many more can be seen in Indian villages. Inter caste/ Religion marriage will lead to murders in rural areas. Child marriage leads to lots of unethical issues. Female feticide leads to gender related issues in rural areas.
6. **Leadership Related Problems:** The specific leadership related problems found in rural areas are: Leadership among the hands of inactive and incompetent people, self-interest of leaders, biased political will, less bargaining power and negation of skills and dominance of political leaders.
7. **Administrative Problems:** The rural administrative problems consist of political interference, lack of motivation and interest, low wages in villages, improper utilization of budget, and absence of monitoring and implementation of rural development programme.

Rural poverty, rural unemployment, rural industries, micro finance, rural heath and sanitation and rural infrastructures are the issues that are considered for detailed discussion.

10.6 Rural Poverty

Rural poverty refers to the existence of poverty in rural areas. Poverty in India has been defined as the situation in which an individual fails to earn sufficient income to buy the basic minimum of subsistence. Poverty line is a hypothetical line based on income or consumption levels that divides the population as people below poverty line and above poverty line. On the basis of recommended nutritional intake, persons consuming less than 2,400 calories per day in rural areas are treated as they are under rural poverty.

As per the Planning Commission estimates, the percentage of people living below poverty in rural areas was 54.10 which accounted for 33.80 per cent during 2009-10. Poverty is deepest among members of scheduled castes and tribes in the rural areas. In 2005 these groups accounted for 80 per cent of rural poor, although their share in the total rural population is much smaller. In 2015, more than 80 crores of India's people lived in villages. One quarter of village population (22 crores people) live below the poverty line. India is the home to 22 per cent of the world's poor. It is needless to state that the country has been successful in reducing the proportion of poor people, in spite of increasing of population.

10.6.1 Causes for Rural Poverty

Various factors responsible for rural poverty are highlighted below:

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1. **Uneven distribution of land :** The distribution of land is highly skewed in rural areas. Therefore, majority of rural people work as hired labour to support their families.
2. **Lack of Non-farm Employment**: Non-farm employment opportunities do not match the increasing labour force. The excess supply of labour in rural areas reduces the wages and increases the incidence of poverty.
3. **Lack of Public Sector Investment**: The root cause of rural poverty in our country is lack of public sector investment on human resource development.
4. **Inflation**: Steady increase in prices affects the purchasing power of the rural poor leading to rural poverty.
5. **Low Productivity**: Low productivity of rural labour and farm activities is a cause as well as the effect of poverty.
6. **Unequal Benefit of Growth**: Major gains of economic development are enjoyed by the urban rich people leading to concentration of wealth. Due to defective economic structure and policies, gains of growth are not reaching the poor and the contributions of poor people are not accounted properly.
7. **Low Rate of Economic Growth**: The rate of growth of India is always below the target and it has benefited the rich. The poor are always denied of the benefits of the achieved growth and development of the country.
8. **More Emphasis on Large Industries**: Huge investment in large industries catering to the needs of middle and upper classes in urban areas are made in India. Such industries are capital-intensive and do not generate more employment opportunities. Therefore, the poor are not in a position to get employed and to come out from the poverty in villages.
9. **Social Evils**: Social evils prevalent in the society like custom, beliefs etc. increase unproductive expenditure.

10.6.2 Remedial Measures to Rural Poverty

Since rural unemployment and rural poverty are interrelated, creation of employment opportunities would support elimination of poverty. Poverty alleviation schemes and programmes have been implemented, modified, consolidated, expanded and improved over time. However, unemployment, begging, rag picking and slumming continues. Unless employment is given to all the people, poverty cannot be eliminated. Who will bell the cat?

Poverty Eradication Schemes	
Schemes	Year of launch
20 Point Programme	1975
Integrated Rural development Programme(IRDP)	1978
Training Rural Youths for Self-Employment (TRYSEM)	1979
Food for Work Programme (FWP)	1977
National Rural Employment Programme (NREP)	1980
Rural Landless Employment Guarantee Programme(RLEGP)	1983
Jawahar Rozgar Yojana(JRY)	1989
Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)	2006

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Development Schemes	
Pradhan Mantri Adarsh Gram Sadak Yojana (PMAGSY)	2010
Bharat Nirman Yojana	2005
Indira Awas Yojana	1985
Jawaharlal Nehru National Urban Renewal Mission (JNNURM)	2005
Rajiv Awas Yojan (RAY)	2009
National Rural Health Mission	2005
National Rural Livelihood Mission	2011
National Food Security Scheme	2013

10.7 Rural Unemployment

Unemployment is a situation in which a person is actively searching for employment but unable to find work at the prevailing wage rate. It is a tragic waste of manpower and under utilisation of human resources. As long as there is unemployment, social problems cannot be stopped; and, economy cannot achieve development.



Peter Diamond, Dale Mortensen and Christopher Pissarides shared 2010 Economics Nobel prize for jobs study.Their model, called DMP model, helps us understand how regulation and economic policies affect unemployment, job vacancies and wages.

As on 4th October 2016, rural unemployment was 7.8 per cent which is less than urban unemployment (10.1 per cent) and all India unemployment rate (8,5 per cent). Rural unemployment in India are categorised into three classes: (i) Open Unemployment (ii) Concealed Unemployment or Under employment and (iii) Seasonal Unemployment. **In Open Unemployment**, unemployed persons are identified as they remain without work. This type of unemployment is found among agricultural labourers, rural artisans and literate persons. **In Concealed Unemployment**, it is difficult to identify who are under employed; for many are employed below their productive capacity and Under employment means a situations where people do not jobs according to their educational level and technical skills. This type of unemployment is found among small and marginal farmers, livestock rearers and rural artisans. This kind of unemployment situation is more serious in villages than in urban areas. Disguised unemployment in rural India is 25 per cent to 30 per cent. **In Seasonal Unemployment**, employment occurs only on a particular season supported by natural circumstances and the remaining period of a year the rural people are unemployed or partially employed. In seasons like ploughing, sowing, weeding and harvesting there is scarcity of labour and in the rest of the year there is unemployment. It is pathetic to note that a farmer who cultivates one crop in a year usually goes without a job for almost 5 to 7 months and ultimately commit suicide.

According to the Agricultural Labour Enquiry Committee Report, "the extent of under employment is on the average, 82 days of unemployment in a year for 84 per cent of agricultural labours."

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10.7.1 Causes for Rural Unemployment

Causes for rural unemployment in India are discussed below:

1. **Absence of skill development and employment generation:** Lack of Government initiatives to give required training and then to generate employment opportunities.
2. **Seasonal Nature of Agriculture**: Agricultural operations are seasonal in nature and depend much on nature and rainfall. Therefore, the demand for labour becomes negligible during off-season. So, non-farm employment opportunities must be created.
3. **Lack of Subsidiary Occupation**: Rural people are not able to start subsidiary occupations such as poultry, rope making, piggery etc. due to shortages of funds for investment and lack of proper marketing arrangements. This restricts the employment opportunity and rural family incomes. Government must arrange funds for these people. However, as now they pay huge interest to the local money lenders, for they are unable to get loans from formal sources.
4. **Mechanization of Agriculture**: The landlords are the principal source of employment to the farm labour. Mechanization of agricultural operations like ploughing, irrigation, harvesting, threshing etc. reduces employment opportunities for the farm labour.
5. **Capital-Intensive Technology**: The expanding private industrial sector is largely found in urban areas and not creating additional employment opportunities due to the application of capital intensive technologies. Government must establish firms to absorb surplus labour power.
6. **Defective System of Education**: The present system of education has also aggravated the rural unemployment problem.Large number of degree-producing institutions has come in the recent years. Students also want to get degrees only, not any skill. Degrees should be awarded only on the basis of skills acquired. The unemployed youth should get sufficient facilities to update their skills.

10.7.2 Remedies for Rural Unemployment

In order to reduce rural unemployment in the country there is a need to take integrated and coordinated efforts from various levels. A few remedial measures are listed below:

1. **Subsidiary Occupation**: To reduce the seasonal unemployment rural people should be encouraged to adopt subsidiary occupations. Loans should be granted and proper arrangements should be made for marketing their products.
2. **Rural Works Programme**: Rural Works Programme such as construction and maintenance of roads, digging of drains, canals, etc should be planned during off-season

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to provide gainful employment to the unemployed.

3. **Irrigation Facilities**: Since rainfall is uncertain irrigation facilities should be expanded to enable the farmers to adopt multiple cropping. The increased cropping intensity creates additional demand for labour.
4. **Rural Industrialization**: To provide employment new industries should be set up in rural areas. This will open new fields of employment and also change the attitude of rural people towards work. For this, government has to do something. Private sector would not take up this responsibility.
5. **Technical Education**: Employment oriented courses should be introduced in schools and colleges to enable the literate youth to start their own units.

10.8 Rural Industries

Rural industries embrace all industries which are run by rural people in rural areas. These industries are based primarily on the utilization of locally available raw materials, skills and small amount of capital. The rural industries can be broadly classified into a) cottage industries, b) village industries, c) small industries, d) tiny industries and e) agro-based industries.

Cottage Industries: Cottage industries are generally associated with agriculture and provide both part-time and full-time jobs in rural areas.

The important characteristics of this type of industries are as follows:

1. These industries are carried out by artisans in their own homes at their own risk and for their own benefit. Artisans may combine this work with another regular job.
2. No or little outside labour is employed. Normally, the members of the household provide the necessary labour.
3. These industries are generally hereditary and traditional in character.
4. No or little power is used.
5. These industries usually serve the local market and generally work on the orders placed by other industries.

Examples of cottage industries are mat, coir and basket making industries. The principal cottage industries of India are hand-loom weaving (cotton, silk, jute, etc.) pottery, washing soap making, conch shell, handmade paper, horn button, mother-of-pearl button, cutlery, lock and key making industries.

Village Industries: Village industries are traditional in nature and depend on local raw-material. They cater to the needs of local population. Examples of village industries are gur and khandsari, cane and bamboo basket, shoe making, pottery and leather tanning. These are almost similar to the cottage industries.

Small Scale Industries (SSIs): Most small scale industries are located near urban centres. They produce goods for local as well as foreign markets. Examples of such small scale industries are manufacture of sports goods, soaps, electric fans, foot wear, sewing machines and handloom weaving.

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SSIs are also known as Micro, Small & Medium Enterprises (MSMEs). They are defined and categorized by the Micro, Small & Medium Enterprises Development Act, 2006. The Act categorizes different scale of industries on the basis of investment in plant and machinery in case of manufacturing industries and on the basis of investment in equipment in case of service sector industries.



Agro-based Industries: These industries are based on the processing of agricultural produce. Agro-based industries may be organised on a cottage-scale, small-scale and large-scale. These industries tend to develop household settlements around them as they employ more labour on a regular basis. Examples are textile, sugar, paper, vegetable oil, tea and coffee industries.

10.9 Rural Indebtedness

Rural indebtedness refers to the situation of the rural people unable to repay the loan accumulated over a period. Existence of the rural indebtedness indicates the weak financial infrastructure of our country, in reaching the needy farmers, landless people and the agricultural labourers.



The farmers borrow loan for various purposes like agricultural operations, supporting the family in the lean season or purchase of equipments in the recent years, expenses on celebrations, liquor consumption, medicines etc. These borrowings go on increasing without any limit. Due to lower income, the villagers are unable to repay the loans or pay the pending interest on the principal amount.

According to the Government of India's Socio Economic and Caste Census (SECC), 2015, around 73 per cent of households in India are rural. Of these, 18.5 per cent are scheduled caste households and 11 per cent belong to the scheduled tribe category.

The data of the National Sample Survey Organisation (NSSO, 2002-03) reveals that only about 30 per cent of the poor borrowers get credit from the formal banks. According to the All India Debt and Investment Survey (AIDIS) 2002, the share of institutional credit has declined from 66.3 per cent in 1991 to 57.1 percent in 2002, with a corresponding increase in informal channels of credit (RBI, 2006).

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10.9.1 Features of Rural Indebtedness

Nearly three fourth of rural families in the country are in debt. The amount of debt is heavier in the case of small farmers. Cultivators are more indebted than the non-cultivators. Most of the debts taken of short term and of unproductive nature. The proportion of debts having higher rates of interest is relatively high. Most of the villagers are indebted to private agencies particularly money lenders.

10.9.2 Causes for Rural Indebtedness

The causes for rural indebtedness may be summarized as below:

1. **Poverty of Farmers:** The vicious circle of poverty forces the farmers to borrow for consumption, cultivation and celebrations. Thus, poverty, debt and high rates of interest hold the farmer in the grip of money lenders.
2. **Failure of Monsoon:** Frequent failure of monsoon is a curse to the farmers and they have to suffer due to the failure of nature. Therefore, farmers find it difficult to identify good years to repay their debts.
3. **Litigation:** Due to land disputes litigation in the court compels them to borrow heavily. Being uneducated and ignorant, they are caught in the litigation process and dry away their savings and resources.
4. **Money Lenders and High Rate of Interest**: The rate of interest charged by the local money lenders is very high and the compounding of interest leads to perpetuate indebtedness of the farmer.

10.9.3 Measures to Remove Rural Indebtedness

Several remedial measures have been introduced to reduce rural indebtedness. It includes regulation of money lenders, development of rural banks, Regional Rural Banks (RRBs), Micro Finance, formation of Self Help Groups (SHGs), Primary Cooperative Banks and Land Development Banks, Crop Loan Schemes, Lead Bank Schemes, Micro Units Development and Refinance Agency Bank (MUDRA), promotion of subsidiary occupation, off farm employment opportunities, skill development programmes and so on. However, the interest rate charged plus transaction cost for poor people and Self-Help Groups are much higher as compared to that for rich people. For instance, education loan is costlier than car loans.

Regional Rural Banks (RRBs)

Regional Rural Banks came into existence based on the recommendation made by a working group on rural banks appointed by the Government of India in 1975. RRBs are recommended with a view to developing rural economy by providing credit and other facilities particularly to the small and marginal farmers, agricultural labourers, artisans and small entrepreneurs. RRBs are set up by the joint efforts of the Centre and the State Governments and the commercial banks. At present, there are 64 Regional Rural Banks in India. The RRBs confine their lendings only to the weaker sections and their lending rates are at par with the prevailing rate of cooperative societies.

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Micro Finance

Micro finance, also known as micro credit, is a financial service that offers loans, savings and insurance to entrepreneurs and small business owners who do not have access to traditional sources of capital, like banks or investors. The goal of micro financing is to provide individuals with money to invest in themselves or their business. Microfinance is available through micro finance institutions, which range from small nonprofit organizations to larger banks. In India, Non Government Organizations (NGOs) play a pivotal role in the development of micro finance service. Microfinance industry in India have grown vastly in the last two decades. In 2009, the total number of micro finance institutions in India was around 150 (Tripathi, 2014).

Self-Help Groups (SHGs)



Self Help Groups are informal voluntary association of poor people, from the similar socio-economic background, up to 20 women (average size is 14). They come together for the purpose of solving their common problems through self-help and mutual help. The SHG promotes small savings among its members. They save small amounts ₹10 to ₹50 a month. The savings are kept with a bank. After saving regularly for a minimum of 6 months, they lend small amounts to their members for interest. Based on their performance, they are linked with the bank for further assistance under SHG Bank Linked Programme (SBLP) started in 1992. It is a holistic programme of micro-enterprises covering all aspects of self-employment, organization of the rural poor into self Help groups and their capacity building, planning of activity clusters, infrastructure build up, technology, credit and marketing.

The main objective of this programme is to bring the beneficiaries above the poverty line by providing income generating assets to them through bank credit and government subsidy. NABARD estimates

In 2009-10, the number of new SHGs having credit-linked with banks was 1.59 million and a bank loan of ₹14,453 Crores was disbursed to these SHGs. Further, the number of SHGs which maintained savings accounts with banks at the end of March 2010 was 6.95 million.

Under NABARD SHG Linkage Programme, SHGs can borrow credit from bank on showing their successful track record of regular repayments of their borrowers. It has been successful in the states like Andhra Pradesh, Tamil Nadu, Kerala and Karnataka during 2005-06. These States received approximately 60 per cent of SHG linkage credit (Taruna and Yadav, 2016).

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that there are 2.2 million SHGs in India, representing 33 million members that have taken loans from banks under its linkage program to date. The SHG Banking Linkage Programme since its beginning has been predominant in certain states, showing spatial preferences especially for the southern regions like Andhra Pradesh, Tamil Nadu, Kerala and Karnataka. These SHGs have helped the Banks to accumulate more funds. Actually the banks charge higher interest for the SHGs than car owners.

Major Features of SHGs are

1. SHG is generally an economically homogeneous group formed through a process of self-selection based upon the affinity of its members.
2. Most SHGs are women's groups with membership ranging between 10 and 20.
3. SHGs have well-defined rules and by-laws, hold regular meetings and maintain records and savings and credit discipline.
4. SHGs are self-managed institutions characterized by participatory and collective decision making.

Micro Units Development and Refinance Agency Bank (MUDRA Bank)

It is a public sector financial institution which provides loans at low rates to micro-finance institutions and non-banking financial institutions which then provide credit to Micro, Small and Medium Enterprises (MSMEs). It was launched on 8th April 2015.



*** Micro Units Development and Refinance Agency**
*** Regulate and Refinance and Microfinance Institutions**

The principal objectives of the MUDRA Bank are the following

1. Regulate the lender and the borrower of microfinance and bring stability to the microfinance system .
2. Extend finance and credit support to Microfinance Institutions (MFI) and agencies that lend money to small businesses, retailers, self-help groups and individuals.
3. Register all MFIs and introduce a system of performance rating and accreditation for the first time.
4. Offer a Credit Guarantee scheme for providing guarantees to loans being offered to micro businesses.
5. Introduce appropriate technologies to assist in the process of efficient lending, borrowing and monitoring of distributed capital.

10.10 Rural Health, Nutrition and Sanitation

Health is an important component for ensuring better quality of life. Large

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masses of the Indian poor continue to by fight hopeless and constantly lose the battle for survival and health. Indian rural people are suffering with various epidemics such as small pox, cholera, malaria, typhoid, dengue, chicken guniya, etc. This is mainly due to lack of medical facilities, deep ignorance and poverty. Indian Constitution clearly lays down that "States shall regard the raising of the level of nutrition and standard of living of its people and improvement of public health as among its primary duties". To meet this constitutional directive, several programmes for nutrition have been implemented. These include Supplementary Feeding Programmes including Mid-day-Meal Programme, Nutrition Education through Printed Media and Television and Compulsory Fortification of Common Salt with Iodine. Still, in terms of health standard, Sri Lanka is better than India, and in India, Kerala is better than Tamil Nadu.

National Rural Health Mission

The National Rural Health Mission (NRHM) was launched on 12th April 2005, to provide accessible, affordable and quality health care to the rural population, especially the vulnerable groups. NRHM seeks to provide equitable, affordable and quality health care to the rural population, especially the vulnerable groups.

NRHM focuses on Reproductive, Maternal, Newborn, Child Health and Adolescent (RMNCH+A) Services. The emphasis here is on strategies for improving maternal and child health through a continuum of care and the life cycle approach.

10.11 Rural Infrastructure

Rural Housing

House is one of the basic needs of every family. Provision of better housing facilities increases the productivity of labour. The housing problem is getting aggravated due to rapid adoptation of nuclear families. Housing does not mean provision of house alone but also proper water supply, good sanitation, proper disposal of sewage etc. The problem of housing can be tackled by the development of low cost technology in house construction, provision of adequate housing finance and provision of land sites to landless workers in rural areas.

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As per the NSSO data, 38 per cent of the households lived in with one room while another 36 per cent lived with two rooms.

Rural Market

Rural Market refers to the infrastructure created to buy and sell the products produced in rural areas and also to purchase the needed products and farm inputs produced in urban and other regions. The rural marketing is still defective as farmers lack bargaining power, long chain of middlemen, lack of organisation, insufficient storage facilities, poor transport facilities, absence of grading, inadequate information and poor marketing arrangements.

Rural roads in India constitute 26.50 lakh kms, of which 13.5 percent of the roads are surfaced.

India's road network is one of the world's largest. The road length of India increased from about 4 lakh kms in 1950-51 to 34 lakh kms at present (2018).

Rural Roads

Road transport is an important constituent of the transport system. Rural roads constitute the very life line of rural economy. A well-constructed road network in rural area would bring several benefits including the linking of remote villages with urban centres, reduction in cost of transportation of agricultural inputs and promotion of marketing for rural produces. It helps the farmers to bring their produce to the urban markets and to have access to distant markets and other services.

Rural Electrification

Rural Electrification refers to providing electrical power to rural areas. The main aims of rural electrification are to provide electricity to agricultural operations and to enhance agricultural productivity, to increase cropped area, to promote rural industries and to lighting the villages. In order to improve this facility the supply of electricity is almost free for agricultural purpose in many states and the electricity tariff charged in rural areas is kept very low. In India 99.25% of villages were electrified at the end of March 2017. As on 31.03.2017, 100 percent electrification was achieved in villages of 20 States/UTs namely, Chandigarh, Delhi, Haryana, Himachal Pradesh, Punjab, Rajasthan, Daman & Diu, D & N Haveli, Goa, Gujarat, Maharashtra, Andhra Pradesh, Kerala, Lakshadweep, Puducherry, Tamil Nadu, Telangana, Andaman & Nicobar Island, Sikkim and Tripura.

The factors hindering the progress of rural electrification in India are:

1. **Lack of Funds:** The generation and transmission of power involves huge expenditure and the fund allocation is low.
2. **Inter-state Disputes:** As there are inter-state disputes in managing power projects, power distribution is affected.
3. **Uneven Terrain:** As rural topography is uneven without proper connection, developing new lines are costlier and difficult.

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4. **High Transmission Loss:** Transmission loss in power distribution is almost 25 per cent in rural areas.
5. **Power Theft:** Unauthorized use and diversion of power are evil practices adopted by affluent people that hinders the rural electrification process.

10.12 Requirements for Rural Development

Slater Villages: Gilbert Slater, the first professor of economics at Madras University, published his book, Some South Indian Villages, in 1918 following a survey of some villages like Vadamalaipuram (Ramnad), Gangaikondan (Tirunelveli), Palakkuurichi (Tanjore) and Dusi (North Arcot) in Tamil Nadu by his students. It was subsequently done by different groups of researchers in the 1930s, 1950s, 1960s, and two of the villages only in the early 21st century. The resurveys became an important historical record. They provided a baseline for several later revisits to these villages, and have inspired many successors. Much of our knowledge of rural change depends on these studies.

1. Efforts need to be made to raise farm and non-farm rural real incomes.
2. Investment in basic infra-structure and social services need to be increased.
3. Coordinated and integrated programmes for solving the present problems and for achieving sustainable development need to be designed.
4. Persons and leaders with an understanding of the reality of rural problems and with the required foresight vision should be consulted while designing development programmes.

10.13 Conclusion

Crucial steps to strengthening the rural economy are already being taken through various policies. These steps include investments in areas ranging from health, information technology, education, infrastructure and small business. The Administration is committed to building on these unprecedented measures in the months and years to come. PURA (Provision of Urban facilities for Rural Areas) needs to be given due emphasis, without which Indian villages cannot prosper.

Glossary

Rural Economics	Application of Economic Principles in rural areas.
Population Density	Number of persons living in one sq.km or per sq. mile area.
Unemployment	Situation of people with willingness and ability to work but not getting employed.

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Open Unemployment	Unemployed persons are identified as they remain without work.
Seasonal Unemployment	Employment occurs only in a particular season and workers remain unemployed in the remaining period of a year.
Under employment	Situation where people employed in excess of the requirements.

Poverty	Condition where the basic needs of the people like food, clothing and shelter are not being met.
Dualism	Co-existence of two extremely different features.
Rural Development	Process of improving the rural areas, rural people and rural living.
Rural Electrification	Providing electrical power to rural areas.

MODEL QUESTIONS

Part - A Choose the Best Answer

1. Which is considered as the basic unit for rural areas?
   - **a.** Panchayat
   - **b.** Village
   - **c.** Town
   - **d.** Municipality

M4ZRE

2. Which feature is identified with rural areas?
   - **a.** Low population density
   - **b.** High population density
   - **c.** Low natural resources
   - **d.** Low human resources

3. Identify the feature of rural economy.
   - **a.** Dependence on agriculture
   - **b.** High population density
   - **c.** Low level of population
   - **d.** Low level of inequality

4. What percentage of the total population live in rural area, as per 2011 censes?
   - **a.** 40
   - **b.** 50
   - **c.** 60
   - **d.** 70

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5. How do you term people employed in excess of the requirements?

   a. Unemployment

   b. Underemployment or Disguised Unemployment

   c. Full employment

   d. Self-employment

6. What is the term used to denote the coexistence of two different features in an economy?

   a. Technology

   b. Dependency

   c. Dualism

   d. Inequality

7. The process of improving the rural areas, rural people and rural living is defined as

   a. Rural economy

   b. Rural economics

   c. Rural employment

   d. Rural development

8. Identify the agriculture related problem of rural economy.

   a. Poor communication

   b. Small size of landholding

   c. Rural poverty

   d. Poor banking network

9. The recommended nutritional intake per person in rural areas.

   a. 2100 calories

   b. 2100 calories

   c. 2300 calories

   d. 2400 calories

10. Indicate the cause for rural poverty.

    a. Lack of non-farm employment

    b. High employment

    c. Low inflation rate

    d. High investment.

11. What is the other name for concealed unemployment?

    a. Open

    b. Disguised

    c. Seasonal

    d. Rural

12. How do you term the employment occurring only on a particular season?

    a. Open

    b. Disguised

    c. Seasonal

    d. Rural

13. Identify an example for rural industries?

    a. Sugar factory

    b. Mat making industry

    c. Cement industry

    d. Paper industry

14. How much share of rural families in India is in debt?

    a. Half

    b. One fourth

    c. Two third

    d. Three fourth

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15. Identify the cause for rural indebtedness in India.

a. Poverty

b. High population

c. High productivity

d. Full employment

16. In which year, Regional Rural Banks came into existence?

a. 1965 b. 1970

c. 1975 d. 1980

17. Identify the year of launch of MUDRA Bank?

a. 1995 b. 2000

c. 2010 d. 2015

18. Identify the year in which National Rural Health Mission was launched.

a. 2000 b. 2005

c. 2010 d. 2015

19. Identify the advantages of rural roads.

a. Rural marketing

b. Rural employment

c. Rural development

d. All the above

20. " An Indian farmer is born in debt, lives in debt, dies in debt and bequeaths debt"-who said this?

a. Adam Smith

b. Gandhi

c. Amartya Sen

d. Sir Malcolm Darling

Answers Part - A

1	2	3	4	5	6	7	8	9	10
b	a	a	c	b	c	d	b	d	a
11	12	13	14	15	16	17	18	19	20
b	c	b	d	a	c	d	b	d	d

Part - B Answer the following questions in one or two sentences

21. Define Rural Economy.

22. What do you mean by Rural Development?

23. Rural Poverty – Define.

24. Define Open Unemployment.

25. What is meant by Disguised Unemployment?

26. Define Cottage Industry.

27. What do you mean by Micro Finance?

28. State any two causes of housing problem in rural areas.

29. Define Rural Electrification.

30. State any two factors hindering Rural Electrification in India.

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Part - C Answer the following questions in about a paragraph each

31. State the importance of Rural Development.
32. Explain the causes for Rural Backwardness.
33. Enumerate the remedial measures to Rural Poverty.
34. What are the remedial measures for Rural Unemployment?
35. Write a note on Regional Rural Banks.
36. Mention the features of SHGs.
37. List out the objectives of MUDRA Bank.

Part - D Answer for each question in about a page

38. 'The features of Rural Economy are peculiar'- Argue.
39. Discuss the problems of Rural Economy.
40. Analyse the causes for Rural Indebtedness.

ACTIVITY

1. ***Take a case of a village where you or nearby you live. Collect the basic information such as, geographical area, boundary areas, population, number of houses, area under cultivation, major crops cultivated, type of infrastructure etc., with the collected information, prepare a report about the village.***

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CHAPTER

11 Tamil Nadu Economy

"If the nature of the work is properly appreciated and applied, it will stand in the same relation to the higher facilities as food is to the physical body"

–J.C.Kumarappa

Learning Objectives

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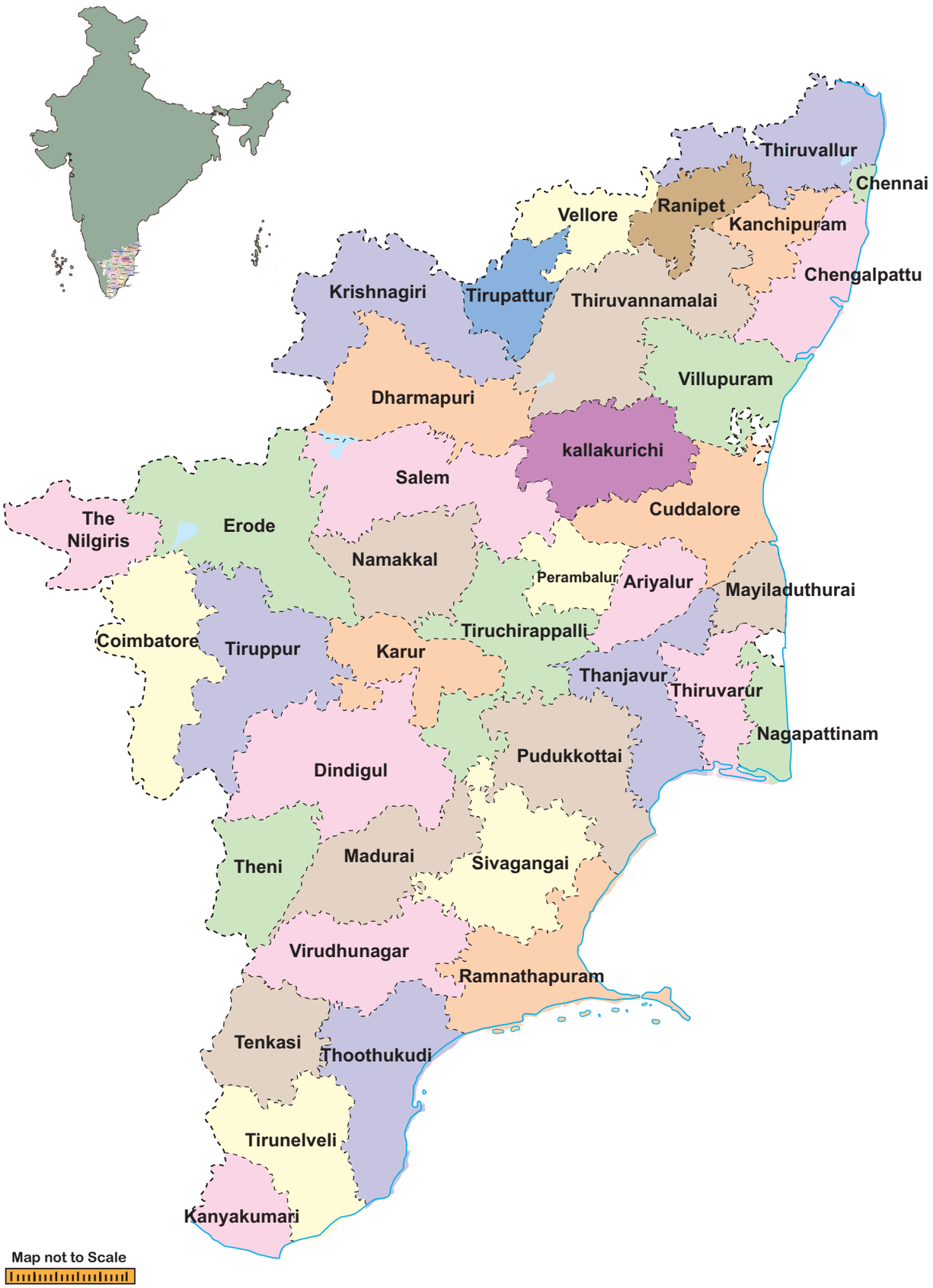
1. To understand the resource position of Tamil Nadu economy
2. To analyse the performance of Tamil Nadu economy in relation to other states.

11.1 Introduction

The economic and social development of states in India are not uniform. Wide regional disparities exist. The western region and southern regions are better off than the other regions. Tamil Nadu is geographically eleventh largest and population wise third largest State. Tamil Nadu fares well with many achievements. It stands second in terms of contribution to GDP, third highest in terms of per capita income, investment, Foreign Direct Investment (FDI) and industrial output. It has been ranked as the most economically free state by the Economic Freedom.

In the social and health sector also Tamil Nadu's performance is better than many other states and better than national average in terms of health, higher education, IMR and MMR.

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11.2 Highlights of Tamil Nadu Economy

- Growth of SGDP in Tamil Nadu has been among the fastest in India since 2005.
- Poverty reduction in Tamil Nadu has been faster than that in many other States.
- Tamil Nadu contains a smaller proportion of India's poor population.
- Tamil Nadu is the second largest contributor to India's GDP.
- Tamil Nadu ranks 3rd in Human Development Index (source: UNDP-2015)
- Tamil Nadu ranks 3rd in terms of invested capital (₹2.92 lakh crore) and value of total industrial output (₹6.19 lakh crore).
- Tamil Nadu ranks first among the states in terms of number of factories with 17% share and industrial workers (16% share) of the country.
- Tamil Nadu is placed third in health index as per the NITI AAYOG report.
- Tamil Nadu has a highest Gross Enrolment Ratio in higher education.
- Tamil Nadu has the largest number of engineering colleges
- Tamil Nadu has emerged as a major hub for renewable energy.
- Tamil Nadu has highest credit Deposit Ratio in commercial and Cooperative banks.
- Tamil Nadu has ranks first on investment proposals filed by MSMEs.

11.3 Performance of Tamil Nadu Economy

Some of the States like Gujarat and Maharashtra seem to perform well in some of the economic indicators. Kerala tops in literacy, IMR and MMR. In recent years Tamil Nadu's performance is outstanding and far ahead of all other states in the spheres of health, higher education, growth of MSMEs, poverty alleviation and employment generation.

Tamil Nadu is placed third in health index

The Tamil Nadu state has come third after Kerala and Punjab in a health index report. The neo natal mortality rate is 14 lower than that of many other states and that the under 5 mortality has dropped from 21 in 2014 to 20 in 2015

- Healthy States, Progressive India Report, (2018) –NITI AAYOG

The reasons for the relative success of Tamil Nadu lie in extending social policies to cover most of the population. For instance the Public Distribution System, midday meals and public health infrastructure have near universal coverage.

11.4 Natural Resources

11.4.1 Water Resources

Tamil Nadu is not endowed with rich natural resources compared to other

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States. It accounts for three per cent of water sources, four per cent of land area against six per cent of population.



North East monsoon is the major source of rainfall followed by South West monsoon. There are 17 river basins in Tamil Nadu. The main rivers are Palar, Cheyyar, Pennaiyar, Cauvery, Bhavani, Vaigai, Chittar, Tamiraparani, Vellar, Noyyal Siruvani, Gundar, Vaipar, Valparai etc. Wells are the largest source of irrigation in Tamil Nadu (56%).

Table 11.1 Water Resources

Source of Irrigation	Numbers
Reservoirs	81
Canals	2239
Tanks	41262
Tube Wells	3,20,707
Open Wells	14,92,359

Source: Tamil Nadu Government Season & Crop Report 2012-13

11.4.2 Mineral Resources

Tamil Nadu has a few mining projects based on Titanium, Lignite, Magnesite, Graphite, Limestone, Granite and Bauxite. The first one is the Neyveli Lignite Corporation that has led to the development of large industrial complex around Neyveli in



Cuddalore district with Thermal power plants, Fertilizer and Carbonisation plants. Magnesite mining is at Salem from which mining of Bauxite ores are carried out at Yercaud and this region is also rich in Iron Ore at Kanjamalai. Molybdenum is found in Karadikuttam in Madurai district.

Table 11.2 Mineral Resources

Mineral	Reserve (Tonnes)	National Share
Lignite	30,275,000	87%
Vermiculite	2,000,000	66%
Garnet	23,000,000	42%
Zircon	8,000,000	38%
Graphite	2,000,000	33%
Ilmenite	98,000,000	28%
Rutile	5,000,000	27%
Monazite	2,000,000	25%
Magnesite	73,000,000	17%

(Source: Department. of Geology and Mining)

11.5 11.5.Population

Tamil Nadu stands sixth in population with 7.21 crore against India's 121 crore as

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per 2011 census. However, Tamil Nadu's population is higher than that of several countries according to UN Report.

Table 11.3 Population

State / Country	Population (in Crore)
Tamil Nadu	7.2
U.K.	6.5
France	6.5
Italy	5.9
South Africa	5.6
Spain	4.7
Sri Lanka	2.1

(Source: Projections published by the United Nations in the 2017 Revision of World Population Prospects.)

11.5.1 Density

The density of population which measures population per sq.km is 555 in 2011 against 480 in 2001. Tamil Nadu ranks 12th in density among the Indian States and 382 is the national average.

11.5.2 Urbanisation

Tamil Nadu is one of the most urbanized states with 48.4% of urban population against 31.5% for India as a whole. The State accounts for 9.61% of total urbanites in India against 6% share of total population.

11.5.3 Sex ratio (Number of females per 1000 males)

Balanced sex ratio implies improvement in quality of life of female population. The sex ratio in Tamil Nadu is nearing balance with 995 which is far better compared to most of the States and all India level. Tamil Nadu stands third next only to Kerala state and Puduchery Union Territory in sex ratio.

Table 11.4 Health and Social Indicators

Sl. No	Indicator	Tamil Nadu	India
1	IMR	17	34
2	MMR	79	159
3	Life Expectancy		
	Total	70.6	67.9
	Male	68.6	66.4
	Female	72.7	69.6
4	Literacy Rate		
	Total	80.33 %	74.04 %
	Male	86.81 %	82.14 %
	Female	73.86 %	65.46 %
5	Sex Ratio	995	940

11.5.4 Infant Mortality Rate (mortality before completing 1 year)

Tamil Nadu is well ahead of national average and other states in IMR. According to NITI AAYOG, the IMR is 17 (per 1000) for Tamil Nadu which is just half of national average of 34 as in 2016.

11.5.5 Maternal Mortality Rate (MMR) (Mother's death at the time of delivery per 1 lakh)

Tamil Nadu has a good record of controlling MMR, ranking third with

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79 (Kerala 61, Maharashtra 67) against national average of 159 again half of the national average [NITI AAYOG].

11.5.6 Life Expectancy at birth

The average period that a person may expect to live is called life expectancy. However, life expectancy in India still falls short of most developed and developing nations.

11.5.7 Literacy

The literacy rate in Tamil Nadu is higher than in many States

11.6 Gross State Domestic Product (GSDP)

Just like GDP, the Gross State Domestic Product refers to the total money value of all the goods and services produced annually in the State.

Tamil Nadu is the second largest economy in India with a GSDP of $ 207.8 billion in 2016-17 according to the Directorate of Economics and Statistics, Tamil Nadu. The GSDP of Tamil Nadu is equal to the GDP of Kuwait on nominal terms and GDP of UAE on PPP terms.

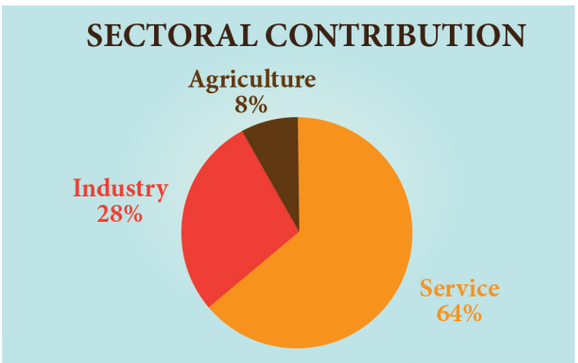
The GSDP of Tamil Nadu is far higher compared to many countries as shown below. This is mainly due to population effect. Per capita GSDP would be better for intercountry or interstate comparisons. Tamil Nadu may go below if per capita GSDP is considered for comparison.

Table 11.5 Gross State Domestic Product

State / Country	GSDP /GDP (Billion)
Tamil Nadu-GSDP	$ 207.8
Iraq-GDP	$ 171
New Zealand-GDP	$ 184
Sri Lanka-GDP	$ 81

(Source: IMF Outlook, April 2017)

11.6.1 Sectoral Contribution



The tertiary sector (service sector) is the major contributor to Tamil Nadu's GSDP at 63.70%. The secondary sector (Industry) contribution is gradually on the rise and now it is 28.5%. Agriculture occupies a prominent position in occupation but its contribution to GSDP is declining and now it is just 7.76%. This means that the tertiary and secondary sectors have grown faster, the agricultural sector has grown slow. Agriculture sector provides employment and food to larger proportion of Indians and Tamils. But, the same sector is growing slowly

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means it is not good. With this trend sustainable development may not be possible.

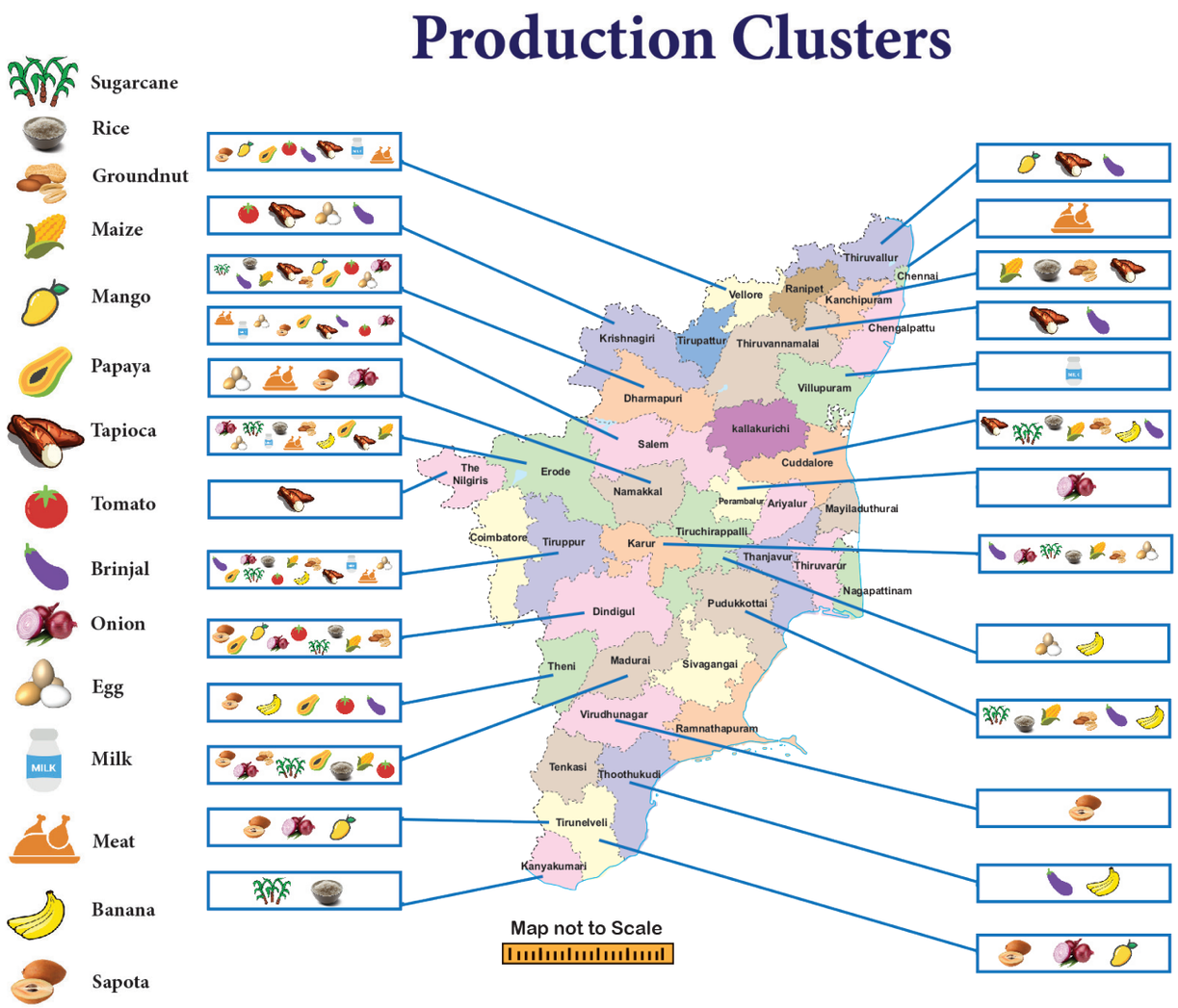
11.6.2 Per capita Income

The Per capita GSDP of Tamil Nadu also ($ 2,200) which is higher than that of many other States in India. Per capita GSDP of Tamil Nadu is nearly 1.75 times higher than the national average, as per 2018 data. In terms of ₹ the per capita income in Tamil Nadu was ₹ 1,03,600 in 2010-11 and it has increased to ₹1,88,492 in 2017-18 as per the Budget figures 2018.

Table 11.6 Per capita income

State / Country	Per capita Income (in USD)
Tamil Nadu	2200
India	1670
Nigeria	2175
Nicaragua	2151
Pakistan	1443
Bangladesh	1358
Zimbabwe	1029
Nepal	729

(Source: World Bank National Accounts data, and OECD National Accounts data files. -https://data.worldbank.org/indicator/NY.GDP.PCAP.CD)



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The Per capita income of Tamil Nadu among the southern States is given below:

Table 11.7 Per capita Income (2015-16)

State	PI (₹)
Tamil Nadu	1,57,116
Kerala	1,55,516
Karnataka	1,46,416
Telangana	1,58,360
Andhra Pradesh	1,37,000

(Source: Reserve Bank of India, New Delhi. February 2017.)

11.7 Agriculture

Tamil Nadu, with seven agro climatic zones and varied soil types is better suited for the production of fruits, vegetables, spices, plantation crops, flowers and medicinal plants. The State is the largest producer of loose flowers and the third largest producer of fruits. Tamil Nadu has historically been an agricultural State. At present, Tamil Nadu is India's second biggest producer of rice, next only to West Bengal. The state is one of the major producers of turmeric. It is also the leading producer of Kambu, Corn, Groundnut, Oil seeds and Sugarcane. It ranks first in production of plantation crops, banana and coconut, second in rubber and cashew nut, third in pepper and fourth in sugarcane.

The gross cropped area under all crops was 58.97 lakh hectares in the year 2013-14. The area under food crops account for 72.9% and that of non-food crops is 27.1%. Among the food crops paddy takes a major share. Among the non-food crops, groundnut and coconut take a major share.

Net sown area has been gradually declining; and, rural land, labour and capital are turned towards urban projects. As a result, villages are emptied and cities are over-crowded and congested, leading to spatially unbalanced bulging.

11.7.1 Foodgrain Production



Rice production dominates among food grain production with 79.49 lakh tones on 2014-15 followed by millets at 40.79 lakh tons. There is significant jump in pulses production from 3.59 lakh tons in 2011-12 to 7.67 lakh tons in 2014-15. There may be changes in these statistics. Hence updation is unavoidable.

11.7.2 Productivity Position of Tamil Nadu and India

The Government of Tamil Nadu lays emphasis on agricultural production and productivity. As a result, Tamil Nadu tops in productivity, in food crops as well as non-food crops, among the States in India.

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Table 11.8 Productivity Position of Tamil Nadu

Crop	Position of Tamil Nadu at National Level
Maize	1
Kambu	1
Groundnut	1
Total Oilseeds	1
Cotton	1
Coconut	2
Rice	2
Sugarcane	3
Sunflower	3
Jowar	3
Coarse cereals	4
Total Pulses	8

Source: Tamil Nadu Agriculture Department Policy Note 2017-18)

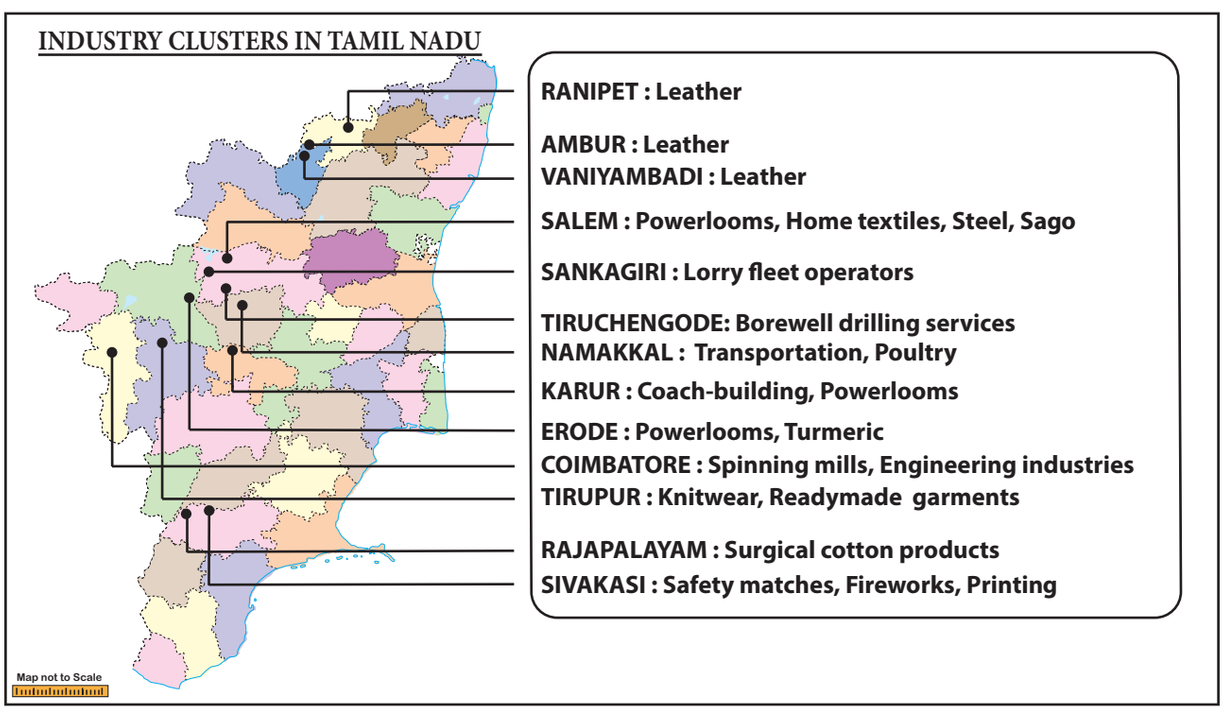
Tamil Nadu ranks first in maize, kambu, groundnut, oil seeds and cotton; second in rice and coconut, third in sugarcane, sunflower and jowar.

11.8 Industry

Chennai is sometimes referred to as the *Health Capital of India* or the *Banking Capital of India*, having attracted investments from International Finance Corporationsand the World Bank. It is also called the *Detroit of Asia*.

Tamil Nadu has a network of about 110 industrial parks/estates that offer developed plots with supporting infrastructure. Also, the Government is promoting other industrial parks like Rubber Park, Apparel Park, Floriculture Park, TICEL Park for Biotechnology, Siruseri IT Park and Agro Export Zones.

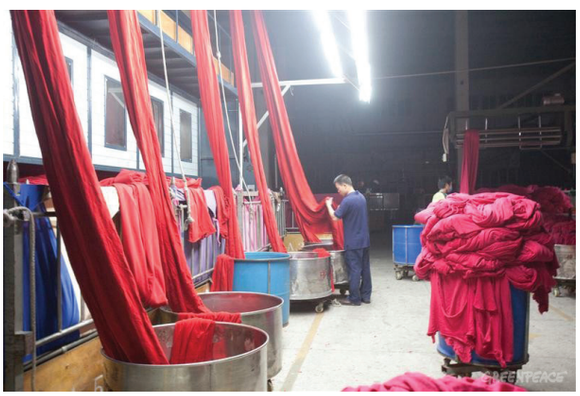
The heavy engineering manufacturing companies are centered around the suburbs of Chennai. Chennai boasts of global car manufacturing giants as well as home grown companies.



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Karur is known for its bus body building which contributes 80% of South Indian bus body building. TNPL is the Asia›s largest ecofriendly paper mill. Salem is called the steel city and has many sago producing units and mineral wealth. Sivakasi is the leader in printing, fireworks, safety matches production in India. It contributes to 80% of India's total safety matches production and 90% of India's total fireworks production. Thoothukudi is the gateway of Tamil Nadu. It is a major chemical producer next only to Chennai.

11.8.1 Textiles



Tamil Nadu is the largest textile hub of India. Tamil Nadu is known as the "***Yarn Bowl***" of the country accounting for 41% of India's cotton yarn production. The textile industry plays a significant role in the Indian economy by providing direct employment to an estimated 35 million people, and thereby contributing 4% of GDP and 35% of gross export earnings. The textile sector contributes to 14% of the manufacturing sector. From spinning to garment manufacturing, entire textile production chain facilities are in Tamil Nadu. About half of India's total spinning mill capacity is in Tamil Nadu. The western part of Tamil Nadu comprising Coimbatore, Tirupur, Erode, Dindigul and Karur has the majority of spinning mills manufacturing cotton/polyester/blended yarn and silk yarn used by garment units in Tamil Nadu, Maharastra etc. Yarn is also exported to China, Bangladesh etc. Tirupur known as "**Knitting City**" is the exporter of garments worth USD 3 Billion. Karur is the major home for textile manufacturing (Curtain cloth, bed linens, kitchen linens, toilet linens, table linens, wall hangings etc.) and export hub in India. Erode is the main cloth market in South India for both retail and wholesale ready-mades.

11.8.2 Leather

Tamil Nadu accounts for 30 per cent of leather exports and about 70 per cent of leather production in the country. Hundreds of leather and tannery industries are located around Vellore, Dindigul and Erode. Every year the State hosts the India International Leather Fair in Chennai.

11.8.3 Electronics

Chennai has emerged as EMS Hub of India. Many multi – national companies have chosen Chennai as their South Asian manufacturing hub.

11.8.4 Automotives

Chennai nick named as "The Detroit of Asia"is home to a large number of auto - mobile component industries. Tamil Nadu has 28% share each in automotive and auto - mobile components industries, 19% in the trucks segment and 18% each in passenger cars and two wheelers.

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11.8.5 Cement Industry

Tamil Nadu ranks third in cement production in India (First Andhra Pradesh, Second Rajasthan). Among 10 largest cement companies in India as on 2018, Ramco Cement and India Cement find prominent place. And also Tamil Nadu stands second in number of cement plants with 21 units against 35 units in Andhra Pradesh.

11.8.6 Fire works



The town of Sivakasi is a leader in the areas of printing, fireworks, and safety matches. It was fondly called the "Little Japan" by Jawaharlal Nehru. It contributes to 80% of India's fireworks production. Sivakasi provides over 60% of India's total offset printing solutions.

11.8.7 Other Industries

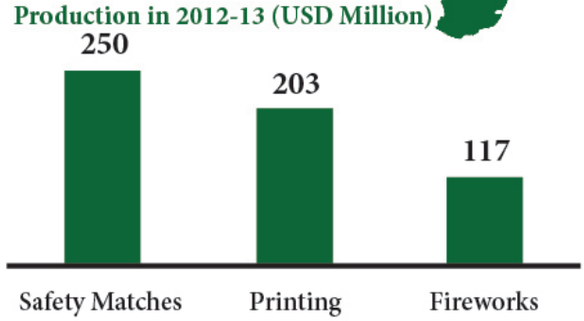
One of the global electrical equipment public sector companies viz BHEL has manufacturing plants at Tiruchirappalli and Ranipet. The Tamil Nadu State Government owns the Tamil Nadu Newsprint and Papers (TNPL), the world's biggest bagasse-based paper mill in Karur. Tamil Nadu is a leading producer of cement in India and with manufacturing units located at Ariyalur, Virudhunagar, Coimbatore and Tirunelveli. The region around Salem is rich in mineral ores. The country's largest public sector is steel undertaking, SAIL has a steel plant in Salem.

Sivakasi-A fireworks manufacturing hub

* Sivakasi is a town in Virudhunagar District of Tamil Nadu
* World renowned firework Production
* Accounts for USD 80 Millon exports of safety Matches, printing and Firework in 2013-14



90% India's Firework Production	450 Firework Factories
0.5 Million direct employment	0.2 Million indirect employment
60% of safety match production	4500 match units



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Coimbatore is also referred to as "the pump City" as it supplies two thirds of India's requirements of motors and pumps. The city is one of the largest exporters of jewellery, wet grinders and auto rickshaws components and the term "Coimbatore Wet Grinder" has been given a Geographical indication

Thoothukudi is known as "Gateway of Tamil Nadu". Thoothukudi is the major chemical producer in the state. It produces the 70 per cent of the total salt production in the State and 30 per cent in the country.

11.8.8 MSMEs

The Micro, Small and Medium Enterprises are defined under the MSMED Act 2006. The enterprises are classified as Manufacturing and Service enterprises based on the investment in plant and machinery and equipment (excluding land and building) the classification of Micro, Small and Medium Enterprises is given in Table- 11.11.

Tamil Nadu accounts for 15.07% Micro, Small and Medium Enterprises (MSMEs) in the country(the highest among all States) with 6.89 lakhs registered MSMEs. Producing over 8000 varieties of product for a total investment of more than ₹32,000 crore.

MSMEs produce a wide variety of products in almost all sectors. The prominent among them are the engineering, electrical, chemicals, plastics, steel paper, matches, textiles, hosiery and garments sector. Around 15.61 lakh entrepreneurs have registered, providing employment opportunities to about 99.7 lakhs persons with total investment of ₹1,68,331 crore.

11.9 Energy

Tamil Nadu tops in power generation among the southern States as seen in the following table.

Installed capacity of power utilities in States in southern region

Table 11.11 Energy

State	Units	Ranks
Tamil Nadu	26,865 MW	I
Karnataka	18,641 MW	II
Andhra Pradesh	17,289 MW	III
Telangana	12,691 MW	IV
Kerala	4,141 MW	V
	79,627 MW	

(Source: Central Electricity Authority, Ministry of Power, Government of India. Retrieved Jan.2017.)

Tamil Nadu is in the forefront of all other Indian States in installed capacity. Muppandal wind farm is a renewable energy source, supplying the villagers with electricity for work. Wind farms were built in Nagercoil and Tuticorin apart from already existing ones around Coimbatore, Pollachi, Dharapuram and Udumalaipettai. These areas generate about half of India's 2,000 megawatts of wind energy or two percent of the total power output of India.

11.9.1 Nuclear Energy

The Kalpakkam Nuclear Power Plant and the Koodankulam Nuclear Power Plant

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are the major nuclear energy plants for the energy grid.

Table 11.12 Nuclear Energy

Units	Existing Installed Capacity (2018)
Kudankulam	1834 MW (2 x 917)
Kalpakkam	470 MW (2 x 235)



11.9.2 Thermal Power

In Tamil Nadu the share of thermal power in total energy sources is very high and the thermal power plants are at Athippattu (North Chennai) Ennore, Mettur, Neyveli and Thoothukudi.

The generation of power under various sources is given below.

Table 11.13 Thermal Power

Source	Million Units	%
Thermal	13304	49.52
Hydel	2203	8.20
Nuclear	986	3.67
Others (Wind, Solar)	10372	38.61
Total	26865	100.00

(Source: Central Electricity Authority, Ministry of Power, Government of India. Retrieved 15 Jan.2017.)

11.9.3 Hydel Energy

There are about 20 hydro electric units in Tamil Nadu. The prominent units are Hundah, Mettur, Periyar, Maravakandy, Parson Valley etc.

11.9.4 Solar Energy

Tamil Nadu tops in solar power generation in India as seen in the following table.

Southern Tamil Nadu is considered as one of the most suitable regions in

Table 11.14 Solar Energy

Ranking	States	Total capacity (MW) 2017
1	Tamil Nadu	1590.97
2	Rajasthan	1317.64
3	Gujarat	1159.76
4	Telangana	1073.41
5	Andhra Pradesh	979.65

(Source :Data from MNRE)

the country for developing solar power projects.

11.9.5 Wind Energy

Tamil Nadu has the highest installed wind energy capacity in India. The State has very high quality of off shore wind energy potential off the Tirunelveli coast and southern Thoothukudi and Rameswaram coast.

11.10 SERVICES

Banking, insurance, energy, transport and communication fall under tertiary sector i.e., services.

11.10.1 Banking

In Tamil Nadu, Nationalised banks account for 52% with 5,337 branches, Private Commercial Banks 30% (3,060) branches, State Bank of India and its associates 13% (1,364), Regional Rural Banks 5% (537) branches and the remaining 22 foreign bank branches.

Total deposits of the banks in Tamil Nadu registered an year-on year increase of 14.32% by March 2017 and touched ₹6,65,068.59 crores. Total credit of the banks in Tamil Nadu registered a year-on year increase of 13.50% by March 2017 and touched ₹6,95,500.31 crores. The share of Priority Sector Advances stands at 45.54% as against the national average of 40%. The percentage of Agricultural advances to total advances as at the end of March 2017 works out to 19.81% as against the national average of 18%. Banks in Tamil Nadu have maintained one of the highest Credit Deposit Ratio of 119.15% in the country whereas this ratio is 77.5% at the national level.

11.10.2 Education

a. School Education

Tamil Nadu is grouped among high Net Enrolement Ratio (NER) States. According to NITI Aayog 2015-16 NER at primary level in Tamil Nadu is 89.24% which is higher than that of Kerala (79.94%) and national average 74.74%. The all India average is 43% and the world average is 59%.

Table 11.15 Tamil Nadu's primary education statistics 2016-17

Number of schools	Primary	35,414
	Middle	9,708
	High and Higher Secondary	12,911

(Source: Tamil Nadu State portal, State interim Budget 2016-17)

Gross Enrolment Ratio is 118.8% for primary level(class 1-5); 112.3% for upper primary level (class 6-8), 62.7% for secondary level (class 9-10), 49.26% at Higher Secondary level (class 11-12). This has been possible mainly due to the supply of free food, cloth, foot-wear, scholarship, laptop etc.

b. Higher Education

In Gross Enrolment Ratio under higher education (Tertiary level) Tamil Nadu continues to be at the top level well ahead of other states. The GER is 46.9% in Tamil Nadu which is far higher than national average and all other States This higher

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GER is thanks to the distribution of free foods,cloths, footwears, laptops and scholarships.

Table 11.16 Gross Enrolment Rate %

State	2015-16	2016-17
Tamil Nadu	44.3	46.9
Maharashtra	29.9	30.2
Uttar Pradesh	24.5	24.9
Odisha	19.6	21.0
Bihar	14.3	14.4
All India	24.5	25.2

(Source: All India Survey on Higher Education (AISHE) released by the Ministry of Human Resource Development- January 2018)

Tamil Nadu has 59 Universities, 40 Medical colleges, 517 Engineering colleges, 2,260 Arts and Science colleges, 447 Polytechnics and 20 dental colleges. Tamil Nadu produces nearly four lakh engineering and polytechnic students every year, the highest in the country.

11.10.3 Educational Loans

As far as educational loans disbursed by Public Sector Banks under priority sector are concerned, 20.8% of the total amount was disbursed in Tamil Nadu between 2013-14 and 2015-16. Andhra Pradesh was second with 11.2% of the total loan amount followed by Maharashtra (10.2%).

Of the total amount of educational loans disbursed by Private Banks during the same period, Kerala accounted for 37.8% followed by Tamil Nadu with 24.8%. Both Karnataka & Kerala together accounted for more than 60% of the total educational loan amount by Private Banks.

11.10.4 Health

Tamil Nadu has a three – tier health infrastructure comprising hospitals, primary health centres, health units, community health centres and sub-centres. As of March 2015, the State had 34 district hospitals, 229 sub-divisional hospitals, 1,254 primary health centres, 7,555 Sub-centres and 313 community health centres.

11.10.5 Communication

Maharashtra has the highest number of internet subscribers in the country at 29.47 million, followed by States like Tamil Nadu, Andhra Pradesh and Karnataka.

According to government data, India had a total of 342.65 million internet subscribers at the end of March, 2016. Tamil Nadu had 28.01 million subscribers, while its neighbours Andhra Pradesh and Karnataka had 24.87 million and 22.63 million, respectively.

11.10.6 Transport

Tamil Nadu has a well established transportation system that connects all parts of the State. This is partly responsible for the investment in the State. Tamil Nadu is served by an extensive road network in terms of its spread and quality, providing links between urban centres, agricultural market-places and rural habitations in the countryside. However, there is scope for improvement.

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a. Road

There are 28 national highways in the State, covering a total distance of 5,036 km. The State has a total road length of 167,000 km, of which 60,628 km are maintained by Highways Department. It ranks second in India with a share of over 20% in total road projects under operation in the public-private partnership (PPP) model.

b. Rail

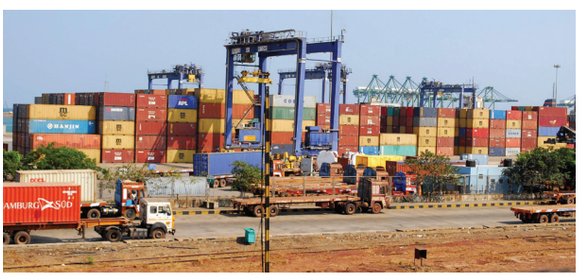


Tamil Nadu has a well-developed rail network as part of Southern Railway, Headquartered at Chennai. The present Southern Railway network extends over a large area of India's Southern Peninsula, covering the States of Tamil Nadu, Kerala, Puducherry, minor portions of Karnataka and Andhra Pradesh. Tamil Nadu has a total railway track length of 6,693 km and there are690 railway stations in the State. The system connects it with most major cities in India. Main rail junctions in the State include Chennai, Coimbatore, Erode, Madurai, Salem, Tiruchirapalli and Tirunelveli. Chennai has a well-established Suburban Railway network, a Mass Rapid Transport System and is currently developing a Metro system, with its first underground stretch operational since May 2017.

c. Air

Tamil Nadu has four major international airports. Chennai International Airport is currently the third largest airport in India after Mumbai and Delhi. Other international airports in Tamil Nadu include Coimbatore International Airport, Madurai International Airport and Tiruchirapalli International Airport. It also has domestic airports at Tuticorin, Salem, and Madurai. which connect several parts of the country. Increased industrial activity has given rise to an increase in passenger traffic as well as freight movement which has been growing at a rate more than 18 percent per year.

d. Ports



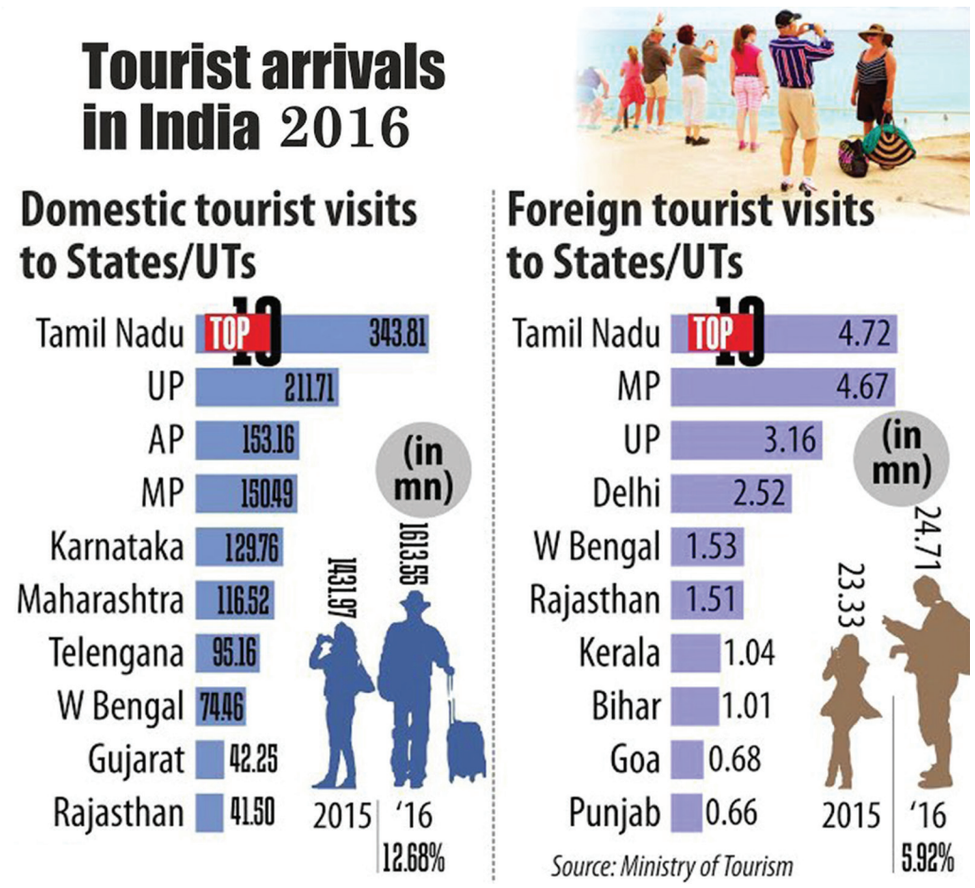
Tamil Nadu has three major ports; one each at Chennai, Ennore, and Tuticorin, as well as one intermediate port in Nagapattinam, and 23 minor ports. The ports are currently capable of handling over 73 million metric tonnes of cargo annually (24 per cent share of India). All the minor ports are managed by the Tamil Nadu Maritime Board, Chennai Port. This is an artificial harbour and the second principal port in the country for handling containers. It is currently being upgraded to have a dedicated terminal for cars capable of handling 4,00,000 vehicles. Ennore Port was recently converted from an intermediate port to a major port and

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handles all the coal and ore traffic in Tamil Nadu.

11.11 Tourism

Tamil Nadu has since ancient past been a hub for tourism. In recent years, the state has emerged as one of the leading tourist destinations for both domestic and foreign tourists. Tourism in Tamil Nadu is promoted by Tamil Nadu Tourism Development Corporation (TTDC), a Government of Tamil Nadu undertaking. The State currently ranks the highest among Indian States with about 25 crore arrivals (in 2013). The annual growth rate of this industry stood at 16 per cent. Approximately 28 lakh foreign and 11 crore domestic tourists visit the State.

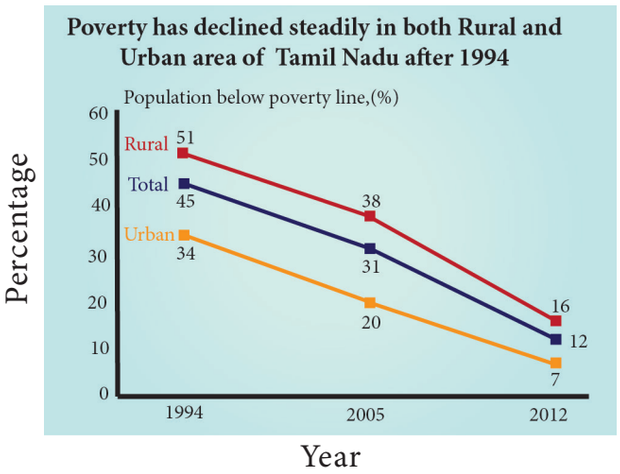


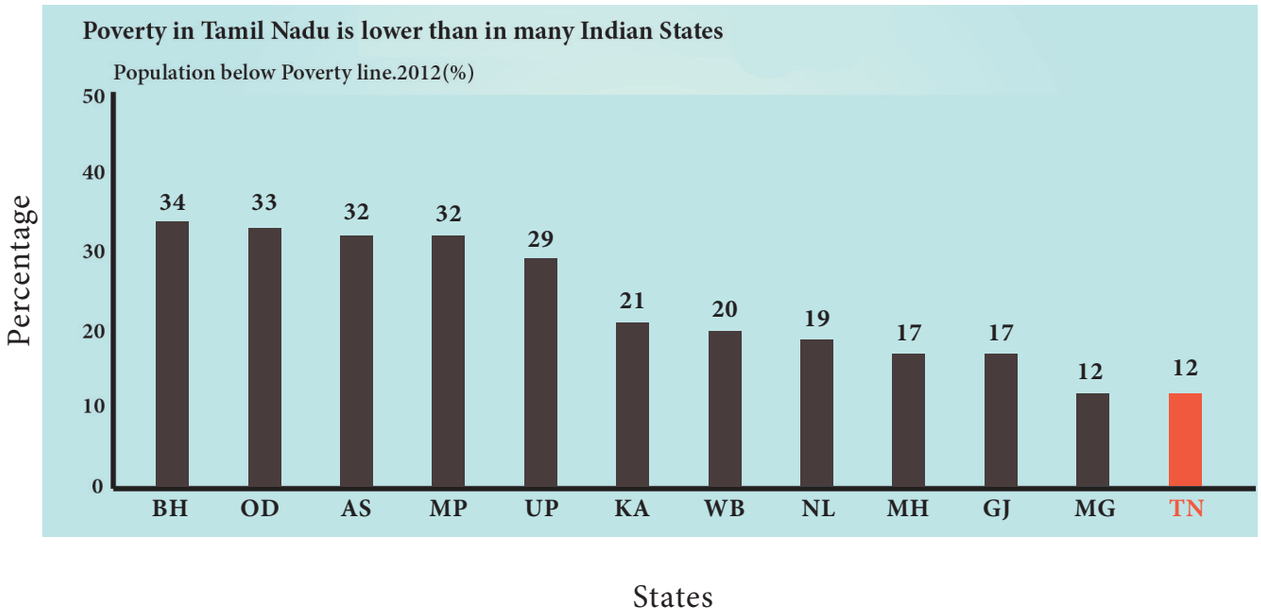
11.12 Unemployment and Poverty

National average of unemployment rate stands at 50 andTamil Nadu ranks 22nd with an unemployment rate of 42 per 1000. There are different kinds of unemployment with different economic implications. All those aspects need to be studied to fully understand the employment situation.

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Tamil Nadu is one of India's richest states Since 1994, the state has seen a steady decline in poverty. Today, Tamil Nadu has lower levels of poverty than most other States in the country. After 2005, Tamil Nadu was among India's fastest growing states, with growth being driven mainly by services.





11.13 Conclusion

The Tamil Nadu economy which is not rich in natural resources has good record of agricultural growth, industrial progress, infrastructural development and good record of robust growth of service sector especially banking, education, transport and tourism. It occupies top three ranks in health index, education, development of MSMEs. It has a good record of poverty alleviation and employment generation. However, India in general and Tamil Nadu in particular need to work more to eliminate female foeticide, reduce the population living in slums, sleeping on roadsides, beggers and rag pickers. Development is meaningless as long as the above eyesore continues.

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Appendix-I

Population Growth in Tami Nadu: At a Glance (2011 Census)	
• Total Population	72138958
• Male	36158871
• Female	35980087
• Crude birth rate (per thousand) • Crude death rate (per thousand) • Growth Rate (per thousand)	15.7 7.4 8.3
• Districts with Highest Population	(Chennai, Kancheepuram, Vellore and Thiruvallur)
• Districts with Lowest Population	(Perambalur, The Nilgiris, Ariyalur and Theni)
• Population Density (per sq km):	555 (2011), 480 (2001)
• Maximum Density	Chennai (26903); Kanyakumari (1106)
• Minimum Density	The Nilgiris (288); Thiruchirappalli (602)
• Sex Ratio (per 1000 males)	995 females (2011) 987 females (2001)
• District with Highest Sex Ratio	The Nilgiris (1041 females) Thanjavur (1031 females) Nagapattinam (1025 females)
• District with Lowest Sex Ratio	Theni (900 females) Dharmapuri (946 females)
• Child Sex Ratio (0-6 age group)	946 female children (2011) 942 female children (2001)
• District with Highest Child Sex Ratio	The Nilgiris (985), Kanyakumari (964)
• District with Lowest Child Sex Ratio	Cuddalore (896); Ariyalur (897)
• Literacy Rate	80.33% (2011) 73.45% (2001)
• Male Literacy	86.81% (2011) 82.33% (2001)
• Female Literacy	73.86% (2011) 64.55% (2001)
• District with Highest Literacy	Kanyakumari (92.14%); Chennai 90.33%)
• District with Lowest Literacy	Dharmapuri(64.71%; Ariyalur (71.99%)

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Glossary

Per capita Income - In come per head (GSDP / Population)

GSDP - Money value of all goods and services produced annually in the State

Neo natal Mortality - Death of kids soon after delivery

Infant Mortality Rate - Death of children before completing one year after birth.

Child Mortality Rate - Death of child before the age of five

C-D Ratio - Ratio of Bank advances to deposits

Bio-diesel - Extraction of oil from plants like jatropha

MSMEs - Micro, Small and Medium Enterprises

Micro Enterprise - Enterprise with a capital investment, not exceeding 25 lakhs (These may change)

Small Enterprise - Unit with investment on plant and machinery above 25 lakhs but below 10 cr. (These may change)

MODEL QUESTIONS

Part-A Multiple Choice Questions

1. In health index, Tamil Nadu is ahead of
   a) Kerala
   b) Punjab
   c) Gujarat
   d) all the above

6LJ08

2. In sex ratio, Tamil Nadu ranks
   a) first
   b) second
   c) third
   d) fourth

3. Tamil Nadu is rich in
   a) Forest resource
   b) human resource
   c) mineral resource
   d) all the above

4. The main source of irrigation in Tamil Nadu is
   a) river
   b) tank
   c) well
   d) canals

5. Knitted garment production is concentrated in
   a) Coimbatore
   b) Tiruppur
   c) Erode
   d) Karur

6. Which of the following is wrongly matched?
   a) Gateway of Tamil Nadu – Thoothukudi
   b) Home textile city - Erode
   c) Steel city - Salem
   d) Pump city - Coimbatore

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7. Which one of the following cities does not have international airport?

a) Madurai

b) Tiruchirappalli

c) Paramakudi

d) Coimbatore

8. TN tops in the production of the following crops except

a) Banana

b) Coconut

c) plantation crops

d) cardamom

9. Largest area of land is used in the cultivation of

a) Paddy

b) sugarcane

c) Groundnut

d) Coconut

10. In literacy rate, TN ranks

a) second

b) fourth

c) sixth

d) eighth

11. In investment proposals filed by MSMEs, TN ranks

a) I

b) II

c) III

d) IV

12. Which district in TN has the highest sex ratio?

a) Nagapattinam

b) Nilgiris

c) Tiruchirappalli

d) Thanjavur

13. Which district has the lowest child sex ratio?

a) Madurai

b) Theni

c) Ariyalur

d) Cuddalore

14. Which Union Territory has the highest sex ratio?

a) Chandigarh

b) Pondicherry

c) Lakshadeep

d) Andaman Nicobar

15. The largest contribution to GSDP in Tamil Nadu comes from

a) agriculture

b) industry

c) mining

d) services

16. In human development index, TN is ranked

a) second

b) fourth

c) sixth

d) third

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17. SPIC is located in

a) Chennai

b) Madurai

c) Tuticorin

d) Pudukkottai

18. The TICEL park is

a) Rubber Park

b) Textile park

c) Food park

d) Bio park

19. In India's total cement production, Tamil Nadu ranks

a) third

b) fourth

c) first

d) second

20. The Headquarters of Southern Railway is at

a) Tiruchirappalli

b) Chennai

c) Madurai

d) Coimbatore.

Answers Part-A

1	2	3	4	5	6	7	8	9	10
c	c	b	c	b	b	c	d	a	d
11	12	13	14	15	16	17	18	19	20
a	b	c	b	d	d	c	d	a	b

Part-B Answer the following questions in one or two sentences.

21. State any two districts with favourable sex ratio. Indicate the ratios.

22. Define GSDP.

23. Mention any four food crops which are favourable to Tamil Nadu.

24. Name the major ports in Tamil Nadu?

25. What is heritage tourism?

26. Name the nuclear power plants in Tamil Nadu?

27. Define Micro industry

Part-C Answer the following questions in one paragraph.

28. Write a note on mineral resources in Tamil Nadu.

29. Explain GSDP in Tamil Nadu.

30. Describe development of textile industry in Tamil Nadu.

31. Compare productivity of any two food crops between Tamil Nadu and India.

32. Explain the prospect for development of tourism.

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33. What are the renewable sources of power in Tamil Nadu?

34. Describe the performance of Tamil Nadu economy in health.

Part-D Answer the following questions in about a page

35. Describe the qualitative aspects of population.

36. Explain the various sources of energy in Tamil Nadu.

37. Explain the public transport system in Tamil Nadu.

ACTIVITY

1. Visit your near by village and make a spot study about crops production, source of irrigation and living condition of farmers.

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CHAPTER

12 Mathematical Methods for Economics

"The master economist must possess a rare combination of gifts. He must be mathematician, historian, statesman, philosopher to some degree"

- J.M.Keynes

Learning Objectives

1. To understand why mathematics is required for economics,
2. To learn the knowledge of mathematical methods, as a facility for self-expression not only in descriptive economics, but also in quantitative economics.

12.1 Introduction

Economic analysis is a systematic approach to (a) determine the optimum use of scarce resources and (b)choose available alternatives and select the best alternative to achieve a particular objective. Mathematical methods are helpful for achieving the objectives of the economic analysis.

12.1.1 Why Study Mathematics?

The subject Economics deals with many quantitative variables and functions, in consumption, production, distribution and policy making. Hence, the mathematical methods would help economists to use the quantitative variables in a better way and to obtain accurate results.

The lengthy and descriptive economic contents can be clearly set in simple notation in mathematical models for clear and easy understanding. For example, **the number of pens demanded in a given time period in a Higher Secondary School is 200 when price is zero. This decreases by 10 for every ₹1 rise in the price of pen**. It is expressed mathematically as

Q = 200 – 10 P, here Q is the quantity demanded and P is the price. Thus large information can be expressed and communicated with simple functions and equations.

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12.1.2 Mathematics in Economics



Sir William Petty
1623-1687

Sir William Petty declared that he wanted to reduce political and economic matters in terms of number, weight and measure. He was the first one to use mathematics in economics. The first known writer to apply mathematical method to economic problems was Giovanni Ceva (1711), an Italian.

12.1.3 Uses of Mathematical Methods in Economics

1. Mathematical Methods help to present the economic problems in a more precise form.
2. Mathematical Methods help to explain economic concepts.
3. Mathematical Methods help to use a large number of variables in economic analyses.
4. Mathematical Methods help to quantify the impact or effect of any economic activity implemented by Government or anybody. There are of course many other uses.



Think and Do

- Who is the father of Economics? Did he use any of the mathematical tools in his contributions? If yes, list out.
- Find out the mathematical tools, which are used by you in your daily routine life.

12.2 Functions

12.2.1 Definition

A function is a mathematical relationship in which the values of a dependent variable are determined by the values of one or more independent variables.

Functions with a single independent variable are called Simple Univariate functions. There is a one to one correspondence. Functions,with more than one independent variable, are called Multivariate functions. The independent variable is often designated by X. The dependent variable is often designated by Y. For example, Y is function of X which means Y depends on X or the value of Y is determined by the value of X. Mathematically one can write Y = f(X).

12.2.2 Linear Equation

A statement of relationship between two quantities is called an equation. In an equation, if the largest power of the independent variable is one, then it is called as Linear Equation. Such equations when graphed give straight lines. For example Y = 100−10X.

For a straight line, there are two variables namely X and Y. X is called independent variable and Y is called dependent variable.

When 'X' value increases by one unit, then the corresponding change in the 'Y' value is called the slope of the line. Slope of the line is obtained by the formula,

m = slope (marginal change)

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$$m = \frac{Y_2 - Y_1}{X_2 - X_1}, \frac{Change\ in\ Y}{Change\ in\ X}.$$

Where (X_1, Y_1) and (X_2, Y_2) are two arbitrary points

Slope or Gradient of the line represents the ratio of the changes in vertical and horizontal lines.

The formula for constructing a straight line is

$$(Y - Y_1) = m(X - X_1)$$

If the two points are (0, 0) and (X, Y) then the formula is Y = mX

Example 12.1

Find the equation of a straight line which passes through two points (2, 2) and (4, –8) which are (X_1, Y_1) and (X_2, Y_2) respectively.

Note: For drawing a straight line, at least two points are required. Many straight lines can pass through a single point.

Solution

Here $X_1 = 2, \quad Y_1 = 2$

$X_2 = 4, \quad Y_2 = -8$

Formula for construction of straight line

$$\frac{Y - Y_1}{Y_2 - Y_1} = \frac{X - X_1}{X_2 - X_1}$$

Applying the values

$$\frac{Y - 2}{-8 - 2} = \frac{X - 2}{4 - 2}$$

$$\frac{Y - 2}{-10} = \frac{X - 2}{2}$$

$$2(Y-2) = -10(x-2)$$

$$2Y-4 = -10x + 20$$

$$2Y = -10x+24$$

$$\boxed{Y = -5x + 12}$$

–5 is slope, denoted by **m**

12 is **Y** intercept, or constant denoted by **c**

This is of the form Y = mX + c

Y = 12–5X when X = 0; Y = 12

When Y = 0; X = 12/5 = 2.4

(This line looks likes demand line in micro economics)

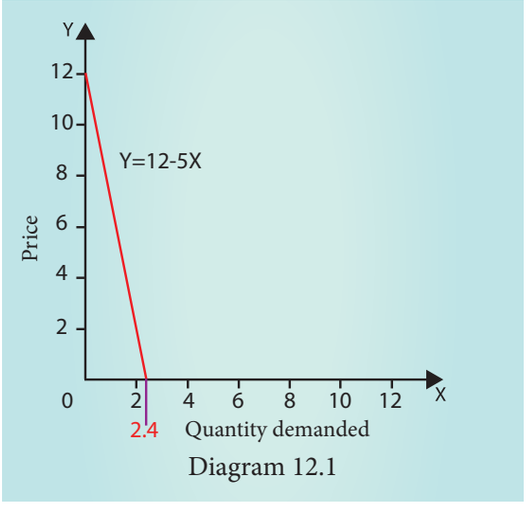


Diagram 12.1

12.2.3 Application in Economics

By applying the above method, the demand and supply functions are obtained.

Demand Function: $Q_d = f(P_x)$ where Q_d stands for Quantity demand of a commodity and P_x is the price of that commodity.

Supply Function: $Q_s = f(P_x)$ where 'Q_s' stands for Quantity supplied of a commodity and P_x is the price of that commodity.

In the example 12.1 the equation Y = –5X + 12 has been obtained. It is a linear function. Since slope is negative here, this function could be a demand function.

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Demand Line

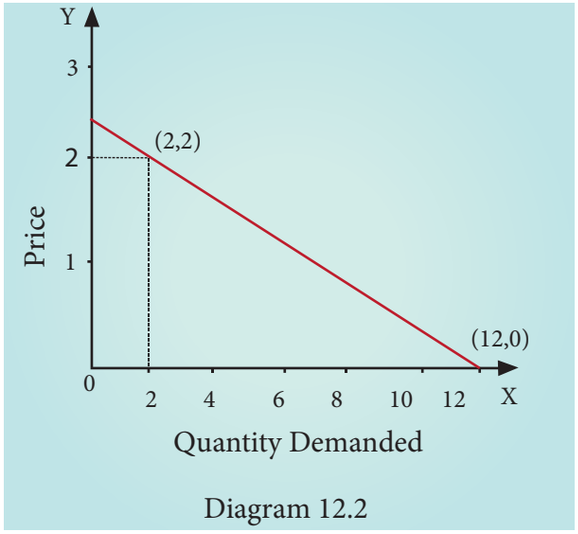


Diagram 12.2

Supply Line

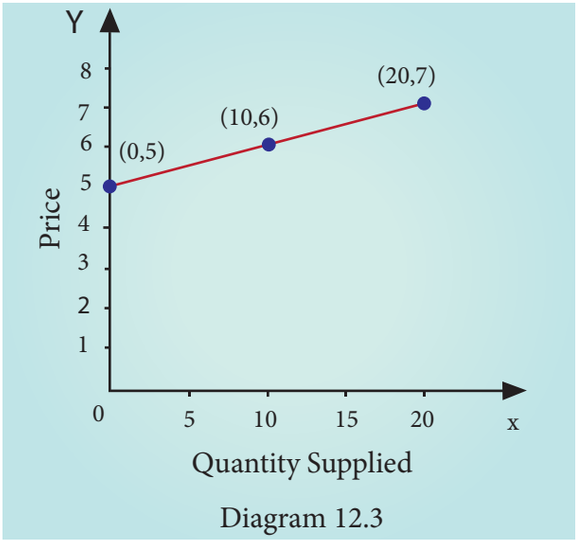


Diagram 12.3

Price-quantity relationship is negative in demand function. $Q_d = 12-5X$ or $Q_d = 12-5P$. If P = 2, $Q_d = 2$.

When P assumes 0, only 12 alone remains in the equation. This is called Intercept or Constant, if P = 0 and $Q_d = 12$.

In Marshallian analysis, money terms measured in Y-axis and physical units are measured in X-axis. Accordingly, price is measured in Y-axis and quantity demanded is measured in X-axis

Example: 12.2

Find the supply function of a commodity such that the quantity supplied is zero, when the price is ₹5 (or below) and the supply (quantity) increases continuously at the constant rate of 10 units for each one rupee rise when the price is above ₹5.

Solution:

To construct the linear supply function atleast two points are needed. First data point of supply function is obtained from the statement that the quantity supplied is zero, when the price is ₹5, that is (0, 5). The second and third data points of supply function can be obtained from the statement that supply increases 10 units for each one rupee rise in price, that is (10, 6) & (20, 7).

When p = 5, supply is zero. When p = 6, supply is 10 and so on. When p is less than 5, say 4, supply is -10, which is possible in mathematics. But it is meaningless in Economics. Normally supply curve originates from zero, noting that when price is zero, supply is also zero.

The equation of the straight line joining two data points (10, 6) and (20, 7) is given as

The equation of the straight line is

$$\frac{Y-Y_1}{Y_2-Y_1}=\frac{X-X_1}{X_2-X_1}$$

substituting the values of (x_1, y_1) (x_2, y_2) by (10, 6) , (20, 7) respectively,

$$\frac{Y-6}{7-6}=\frac{X-10}{20-10}$$

$$\frac{Y-6}{1}=\frac{X-10}{10}$$

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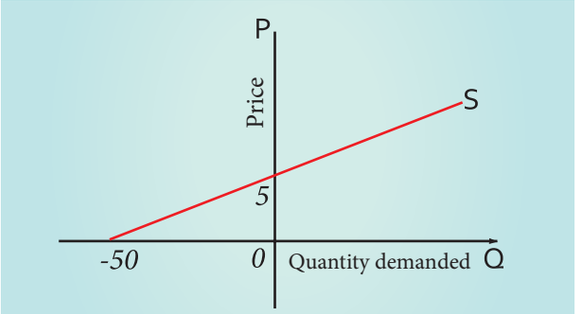


Diagram 12.4

Then $$Y-6=\frac{X-10}{10}$$

$$10(Y-6)=X-10$$

$$10Y-60=X-10$$

$$10Y-60+10=X$$

$$10Y-50=X$$

$$-X=-10Y+50$$

Multiplying both sides by minus (–), we get

$$X=-50+10Y$$

Considering X as quantity supplied and Y as price (P)

Then X = 10P – 50 (or)

$$\boxed{X=-50+10P}$$

If Price = 0; Q = –50

If Q = 0; P = 5

Note: The coefficient of 'P' is – in demand function.

The coefficient of 'P' is + in supply function.

12.2.4 Equilibrium

The point of intersection of demand line and supply line is known as equilibrium. The point of equilibrium is obtained by using the method of solving a set of equations. One can obtain the values of two unknowns with two equations. At equilibrium point,

Demand = Supply

(These are hypothetical examples)

$$100-10P=50+10P$$

$$100-50=20P$$

$$50=20P$$

$$\frac{50}{20}=P$$

$$P=2.5$$

When P = 2.5, Demand = 100–10 (2.5)

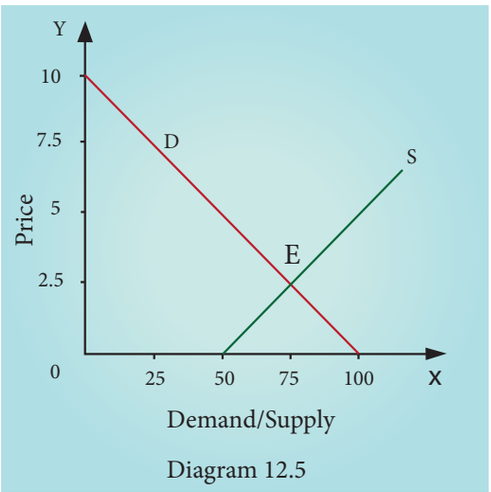
= 75

When P = 2.5, Supply = 50 +10 (2.5)

= 75

Example: 12.3

Find the equilibrium price and quantity by using the following demand and supply functions Qd = 100–5P and Q_s = 5P respectively.



Demand/Supply

Diagram 12.5

Solution:

Equilibrium is attained when,

$$Q_s=Q_d$$

$$5P=100-5P$$

$$10P=100$$

$$P=10$$

When P = 10

In supply function

$$Q_s=5P=5\times 10=50$$

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In demand function,

$Q_d = 100 - 5\,P = 100 - 5(10) = 50$

Hence at

$P = 10,\ Q_d = 50,\ Qs = 50.$

Quantity demanded is equal to supply at 50 units when price is ₹10

Example: 12.4

The market demand curve is given by D = 50 – 5P. Find the maximum price beyond which nobody will buy the commodity.

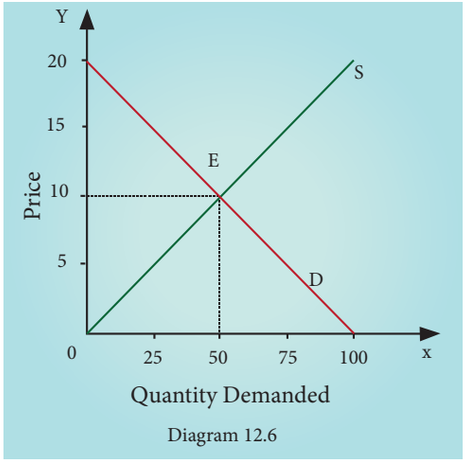


Diagram 12.6

Solution:

Given

$Q_d = 50 - 5P$

$5P = 50 - Q_d$

$5P = 50$ when Q_d is zero.

$$P = \frac{50}{5}$$

P = 10 When P = 10, Demand is 0

Hence P = 10, which is the maximum price beyond which nobody will demand the commodity.

Example: 12.5

The demand for milk is given by

Price (Y)	1	2	3
Demand (X)	100	50	0

Find the linear demand function and its slope.

Solution:

Equation of demand function joining two data points (100, 1) and (50, 2) are (x_1, y_1) and (x_2, y_2) respectively.

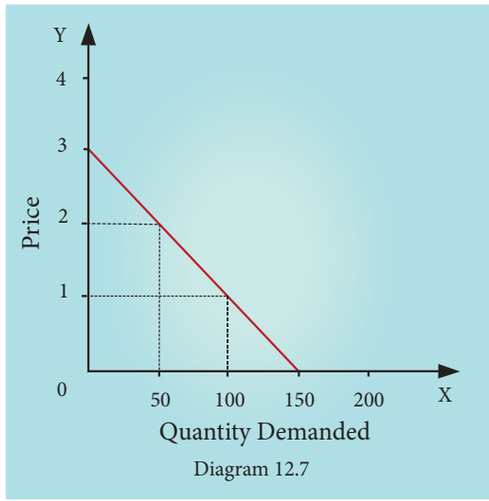


Diagram 12.7

$$\frac{Y - Y_1}{Y_2 - Y_1} = \frac{X - X_1}{X_2 - X_1}$$

$$\frac{Y - 1}{2 - 1} = \frac{X - 100}{50 - 100}$$

$$\frac{Y - 1}{1} = \frac{X - 100}{-50}$$

$$-50\,(Y - 1) = 1\,(X - 100)$$

$$-50Y + 50 = X - 100$$

$$-50Y + 50 + 100 = X$$

$$-50Y + 150 = X$$

$$X = 150 - 50Y$$

Hence the demand function is

$Q_d = 150 - 50P$ and Slope $m = -50$



Think and Do for Water Management in your area

Try to find the demand function for water in your street and the daily total demand for water in litre for all purposes.

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12.3 Matrices

12.3.1 Matrices

'Matrix' is a singular while 'matrices' is a plural form. Matrix is a rectangular array of numbers systematically arranged in rows and columns within brackets. In a matrix, if the number of rows and columns are equal, it is called a square matrix.

12.3.2 Determinants

For every square matrix, there exists a determinant. This determinant is an arrangement of same elements of the corresponding matrix into rows and columns by enclosing vertical lines.

For example,

$\begin{pmatrix} 1 & 3 & 5 \\ 6 & 2 & 4 \\ 7 & 8 & 9 \end{pmatrix}$ is a square matrix of order 3 x 3,then

$\begin{vmatrix} 1 & 3 & 5 \\ 6 & 2 & 4 \\ 7 & 8 & 9 \end{vmatrix}$ is a determinant.

$\begin{pmatrix} 2 & 3 \\ 5 & 7 \end{pmatrix}$ is a square matrix of order 2 x 2, then

$\begin{vmatrix} 2 & 3 \\ 5 & 7 \end{vmatrix}$ is a determinant.

In general, if $A = \begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{pmatrix}$ is a matrix then,

$\begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$ is a determinant of the matrix A denoted by $|A|$.

The value of the determinant is expressed as a single number.

Calculation of the value of determinant for a 2 x 2 matrix is shown below

$$\text{If } |A| = \begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix} \text{ then } |A| = a_1b_2 - a_2b_1$$

Calculation of determinant value for a 3 x 3 matrix is shown below

$$\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix} = a_1 \begin{vmatrix} b_2 & c_2 \\ b_3 & c_3 \end{vmatrix} - b_1 \begin{vmatrix} a_2 & c_2 \\ a_3 & c_3 \end{vmatrix} + c_1 \begin{vmatrix} a_2 & b_2 \\ a_3 & b_3 \end{vmatrix}$$

$= a_1(b_2c_3 - b_3c_2) - b_1(a_2c_3 - a_3c_2) + c_1(a_2b_3 - a_3b_2)$

Example: 12.6

Find the value of the determinant for the matrix $A = \begin{pmatrix} 3 & 4 \\ 10 & -2 \end{pmatrix}$

Solution:

Given matrix $A = \begin{pmatrix} 3 & 4 \\ 10 & -2 \end{pmatrix}$ then, the Determinant

$$|A| = \begin{vmatrix} 3 & 4 \\ 10 & -2 \end{vmatrix} = 3(-2) - 10(4)$$

$= -6 - 40 = -46$ is the value of the determinant.

Example: 12.7

Find the value of the determinant of the matrix

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$$A = \begin{pmatrix} 3 & 4 & 7 \\ 2 & 1 & 3 \\ 7 & 2 & 1 \end{pmatrix}$$

Solution:

Determinant of the given matrix is,

$$|A| = \begin{vmatrix} 3 & 4 & 7 \\ 2 & 1 & 3 \\ 7 & 2 & 1 \end{vmatrix} = 3\begin{vmatrix} 1 & 3 \\ 2 & 1 \end{vmatrix} - 4\begin{vmatrix} 2 & 3 \\ 7 & 1 \end{vmatrix} + 7\begin{vmatrix} 2 & 1 \\ 7 & 2 \end{vmatrix}$$

$$= 3\,(1 - 6) - 4\,(2 - 21) + 7\,(4 - 7)$$

$$= 3\,(-5) - 4\,(-19) + 7\,(-3)$$

$$= -15 + 76 - 21$$

$$\boxed{|A| = 40}$$

The value of determinant is 40.

12.3.3 Cramer's Rule



G. CRAMER
(1704-1752)

Cramer's rule provides the solution of a system of linear equations with '**n**' variables and '**n**' equations. It helps to arrive at a unique solution of a system of linear equations with as many equations as unknowns.

If the given equations are

$$a_{11}x + a_{12}y + a_{13}z = b_1$$

$$a_{21}x + a_{22}y + a_{23}z = b_2$$

$$a_{31}x + a_{32}y + a_{33}z = b_3$$

then

$$x = \frac{\Delta x}{\Delta},\quad y = \frac{\Delta y}{\Delta},\quad z = \frac{\Delta z}{\Delta}$$

where, $\Delta = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$

$$\Delta_x = \begin{vmatrix} b_1 & a_{12} & a_{13} \\ b_2 & a_{22} & a_{23} \\ b_3 & a_{32} & a_{33} \end{vmatrix}, \Delta_y = \begin{vmatrix} a_{11} & b_1 & a_{13} \\ a_{21} & b_2 & a_{23} \\ a_{31} & b_3 & a_{33} \end{vmatrix},$$

$$\Delta z = \begin{vmatrix} a_{11} & a_{12} & b_1 \\ a_{21} & a_{22} & b_2 \\ a_{31} & a_{32} & b_3 \end{vmatrix}$$

Key Note

If the determinant $\Delta = 0$, then solution does not exist.

Example: 12.8

Find the value of x and y in the equations by using Cramer's rule. $x + 3y = 1$ and $3x - 2y = 14$

Solution:

Given equations are

$$x + 3y = 1$$
$$3x - 2y = 14$$

Then the equations in the matrix form :

$$\begin{pmatrix} 1 & 3 \\ 3 & -2 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 1 \\ 14 \end{pmatrix}$$

Calculating Δ, $\Delta = \begin{vmatrix} 1 & 3 \\ 3 & -2 \end{vmatrix}$

$$= -2 - 9$$
$$= -11$$

$\Delta \neq 0$, Hence solution exists.

$$\Delta_x = \begin{vmatrix} 1 & 3 \\ 14 & -2 \end{vmatrix} = -2 - 42 = -44$$

$$\Delta_y = \begin{vmatrix} 1 & 1 \\ 3 & 14 \end{vmatrix} = 14 - 3 = 11$$

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Hence $x = \frac{\Delta x}{\Delta} = \frac{-44}{-11} = 4$, $y = \frac{\Delta y}{\Delta} = \frac{11}{-11} = -1$

$\therefore x = 4$ and $y = -1$

Answer checking:

Substituting in equation the values of x and y,

4 + 3(-1) = 1,

3(4) – 2(-1)= 14

Example: 12.9

Find the solution of the system of equations.

$$5x_1 + 3x_2 = 30$$

$$6x_1 - 2x_2 = 8$$

Solution:

The coefficient and the constant terms are given below for the equations

$$\Delta = \begin{vmatrix} 5 & 3 \\ 6 & -2 \end{vmatrix} = -10 - 18 = -28$$

$$\Delta x_1 = \begin{vmatrix} 30 & 3 \\ 8 & -2 \end{vmatrix} = -60 - 24 = -84$$

$$\Delta x_2 = \begin{vmatrix} 5 & 30 \\ 6 & 8 \end{vmatrix} = +40 - 180 = -140$$

$$\therefore x_1 = \frac{\Delta x_1}{\Delta} = \frac{-84}{-28} = 3$$

$$x_2 = \frac{\Delta x_2}{\Delta} = \frac{-140}{-28} = 5$$

$\therefore x_1 = 3, \quad x_2 = 5$

Example: 12.10

Find the solution of the system of equation

$$7x_1 - x_2 - x_3 = 0$$

$$10x_1 - 2x_2 + x_3 = 8$$

$$6x_1 + 3x_2 - 2x_3 = 7$$

Solution:

The matrix form of the given equation is written as

$$\begin{bmatrix} 7 & -1 & -1 \\ 10 & -2 & 1 \\ 6 & 3 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 0 \\ 8 \\ 7 \end{bmatrix}$$

$$\Delta = \begin{vmatrix} 7 & -1 & -1 \\ 10 & -2 & +1 \\ 6 & 3 & -2 \end{vmatrix}$$

$$= 7(4-3)-(-1)(-20-6)+(-1)(30+12)$$

$$= 7(1) + 1(-26) - 1(42)$$

$$= 7 - 26 - 42 = -61$$

$$\Delta x_1 = = \begin{vmatrix} 0 & -1 & -1 \\ 8 & -2 & 1 \\ 7 & 3 & -2 \end{vmatrix}$$

$$= 0(4-3)-(-1)(-16-7) + (-1)(24 + 14)$$

$$= 0 + 1(-23)-1(38)$$

$$= -23 - 38 = -61$$

$$\Delta x_2 = = \begin{vmatrix} 7 & 0 & -1 \\ 10 & 8 & 1 \\ 6 & 7 & -2 \end{vmatrix}$$

$$= 7(-16-7)-0(-20-6)+(-1)(70-48)$$

$$= 7(-23) + 0 - 1(22)$$

$$= -161-22 = -183$$

$$\Delta x_3 = = \begin{vmatrix} 7 & -1 & 0 \\ 10 & -2 & 8 \\ 6 & 3 & 7 \end{vmatrix}$$

$$= 7(-14-24) - (-1)(70-48) + 0(30 + 12)$$

$$= 7(-38) + 1(22) + 0$$

$$= -266 + 22 = -244$$

$$x_1 = \frac{\Delta x_1}{\Delta} = \frac{-61}{-61} = 1$$

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$$x_2 = \frac{\Delta x_2}{\Delta} = \frac{-183}{-61} = 3$$

$$x_3 = \frac{\Delta x_3}{\Delta} = \frac{-244}{-61} = 4$$

12.3.4 Application in Economics

Example 12.11

Mr.Anbu, purchased 2 pens, 3 pencils and 1 note book. Mr.Barakath , purchased 4 pens, 3 pencils and 2 notebooks. Mr.Charles purchased 2 pens, 5 pencils and 3 notebooks. They spent ₹32, ₹52 and ₹60 respectively. Find the price of a pen, a pencil and a note book.

Solution:

Let x be the price of a pen, y be the price of a pencil and z be the price of a notebook,

In equations:

$2x + 3y + 1z = 32,$

$4x + 3y + 2z = 52,$

$2x + 5y + 3z = 60$

In matrix form

$$\begin{bmatrix} 2 & 3 & 1 \\ 4 & 3 & 2 \\ 2 & 5 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 32 \\ 52 \\ 60 \end{bmatrix}$$

$$\begin{aligned} \Delta &= 2(9-10) - 3(12-4) + 1(20-6) \\ &= 2(-1) - 3(8) + 1(14) \\ &= -2 - 24 + 14 = -12 \end{aligned}$$

To find Δ_x

$$\Delta_x = \begin{vmatrix} 32 & 3 & 1 \\ 52 & 3 & 2 \\ 60 & 5 & 3 \end{vmatrix}$$

$$\begin{aligned} \Delta_x &= 32(9-10) - 3(156-120) + 1(260-180) \\ &= 32(-1) - 3(36) + 1(80) \\ &= -32 - 108 + 80 = -60 \end{aligned}$$

To find Δ_y

$$\Delta_y = \begin{vmatrix} 2 & 32 & 1 \\ 4 & 52 & 2 \\ 2 & 60 & 3 \end{vmatrix}$$

$$\begin{aligned} \Delta y &= 2(156-120) - 32(12-4) + 1(240-104) \\ &= 2(36) - 32(8) + 1(136) \\ &= 72 - 256 + 136 = -48 \end{aligned}$$

To find Δ_z

$$\Delta_z = \begin{vmatrix} 2 & 3 & 32 \\ 4 & 3 & 52 \\ 2 & 5 & 60 \end{vmatrix}$$

$$\begin{aligned} \Delta z &= 2(180-260) - 3(240-104) + 32(20-6) \\ &= 2(-80) - 3(136) + 32\ (14) \\ &= -160 - 408 + 448 = -120 \end{aligned}$$

$$x = \frac{-60}{-12} = 5 \quad (\text{Price of a pen})$$

$$y = \frac{-48}{-12} = 4 \quad (\text{Price of a pencil})$$

$$z = \frac{-120}{-12} = 10 \quad (\text{Price of a notebook})$$

Answer checking

$2(5)+3(4)+1(10)=32$

$4(5)+3(4)+2(10)=52$

$2(5)+5(4)+3(10)=60$



Think and Do

Fathima, purchased 6 pens and 5 Pencils spending ₹49, Rani purchased 3 Pens and 4 pencils spending ₹32. What is the price of a pen and pencil?

$$\begin{bmatrix} 6 & 5 \\ 3 & 4 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 49 \\ 32 \end{bmatrix}$$

Solution : Price of a pen = ₹4

Price of a pencil = ₹5

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12.4 DIFFERENTIAL CALCULUS

12.4.1 Meaning

The fundamental operation of calculus is differentiation. Derivative is used to express the rate of change in any function. Derivative means a change in the dependent variable with respect to small change (closer to zero) in independent variable.

Let the function be,

$y = f(x)$

Differentiating y with respect to x is,

$$\frac{d(y)}{dx} = \frac{df(x)}{dx}$$

12.4.2 Some Standard Forms of Differentiation

(Constant, addition and subtraction only)

1. $\frac{d(c)}{dx} = 0$ where C is a constant.

   (Read differentiation of 'C' with respect to 'x' is)

2. $\frac{d(x^n)}{dx} = nx^{n-1}$

3. $\frac{d(x)}{dx} = 1x^{1-1} = 1x^0 = 1$

4. $\frac{d(u+v)}{dx} = \frac{du}{dx} + \frac{dv}{dx}$

5. $\frac{d(u-v)}{dx} = \frac{du}{dx} - \frac{dv}{dx}$

Key Note

If the power of any non-zero real number is zero, it's value is 1
$x^0 = 1$ when $x \neq 0$

Example: 12.12

If Y = 4, then find $\frac{dy}{dx}$

Solution:

Y = 4, here 4 is a constant.Differentiation of constant function is zero.

So, $\frac{dy}{dx} = \frac{d(4)}{dx} = 0$

Example: 12.13

Find the slope of the function $y = 6x^3$ for any value of x.

Solution:

Given $y = 6x^3$

Slope $= \frac{dy}{dx}$

$\frac{dy}{dx} = 6(3)x^{3-1} = 18x^2$ for any value of x.

Example: 12.14

What is the slope of the function $y = 5x^4$ when x = 10?

Solution:

Given function $y = 5x^4$

Slope $= \frac{dy}{dx}$

$\frac{dy}{dx} = 5(4)x^{4-1}$

$= 20x^3$

When x = 10, then slope = $20\ (10)^3$

$= 20{,}000,$

Therefore Slope is 20,000.

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Example: 12.15

Differentiate the function $Y = 3x^2 + 16x^3$ with respect to x.

Solution:

$$Y = 3x^2 + 16x^3$$

Differentiating,

$$\frac{dy}{dx} = 3(2)x^{2-1} + 16(3)x^{3-1}$$

$$= 6x^1 + 48x^2$$

$$\frac{dy}{dx} = 6x + 48x^2$$

Example: 12.16

If $Y = 2x^3 - 6x$, then find $\frac{dy}{dx}$

Solution:

$Y = 2x^3 - 6x$

Differentiate 'y' with respect to x,

$$\frac{dy}{dx} = 2(3)x^{3-1} - 6(1)x^{1-1}$$

$$= 6x^2 - 6x^0$$

$$\frac{dy}{dx} = 6x^2 - 6$$

12.4.3 Application of Differential Calculus

The relation between two or more variables can be expressed by means of a function. Continuous functions alone are differentiable. For instance, the differential calculus is applicable for finding the following:

(1) The rate of change in demand with respect to price (in micro economics)

(2) The rate of change in income with respect to the investment. (in macroeconomics) .

12.4.4 Marginal concepts

Marginal concept is concerned with variations of Y (on the margin of X), that is, it is the variation corresponding in Y to a very small variation in X. (X is the independent variable and Y is the dependent variable)

12.4.5 Marginal Product

Marginal product of a factor of production refers to addition to total product due to the use of an additional unit of a factor.

$$MP = d(TP)/dQ = \Delta TP/\Delta Q$$

12.4.6 Marginal Cost

Marginal cost is an addition to the total cost caused by producing one more unit of output. In symbols:

$$MC = \frac{d(TC)}{dQ} \text{ or } MC = \frac{\Delta(TC)}{\Delta Q}$$

Where, ΔTC represents a change in total cost and ΔQ represents a small change in output or quantity. (in economics one worker, one output etc are assumed to be very small units)

Example: 12.17

Given the total cost function, $TC = 15 + 3Q^2 + 7Q^3$, drive the marginal cost function.

Solution:

$$TC = 15 + 3Q^2 + 7Q^3$$

$$MC = \frac{d(15)}{dQ} + \frac{d(3Q^2)}{dQ} + \frac{d(7Q^3)}{dQ}$$

$$= 0 + 3(2)Q^{2-1} + 7(3)Q^{3-1}$$

$$MC = 6Q + 21Q^2$$

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12.4.7 Marginal Revenue

Marginal Revenue is the revenue earned by selling an additional unit of the product. In other words, Marginal Revenue is an addition made to the total revenue by selling one more unit of the good.

$$MR = \frac{d(TR)}{dQ} \; or = \frac{\Delta TR}{\Delta Q}$$

Where ΔTR stands for change in the total revenue, and ΔQ stands for change in output.

Example: 12.18

Given TR = $50Q - 4Q^2$,find marginal revenue when Q = 3.

Solution:

$TR = 50Q - 4Q^2$

$MR = d(TR)/dQ$

$MR = 50(1)Q^{1-1} - 4(2)Q^{2-1}$

$= 50(1)Q^0 - 8\,Q^1$

$= 50(1) - 8Q \quad (\therefore Q^0 = 1, Q^1 = Q)$

$MR = 50 - 8Q$

When Q = 3

$MR = 50 - 8(3) = 26$

Example: 12.19

A producer has the total cost function $TC(Q) = Q^3 - 18Q^2 + 91Q + 10$ where costs are given in rupees. Find the marginal cost (MC) and the average variable cost (AVC), when Q =3.

Solution:

Given $TC(Q) = Q^3 - 18Q^2 + 91Q + 10$, To find MC differentiate the function with respect to Q.

$$MC(Q) = \frac{d(TC)}{dQ} = 3Q^{3-1} - 18(2)Q^{2-1} + 91(1)Q^{1-1} + 0$$

$= 3Q^2 - 36Q^1 + 91Q^0 + 0$

$MC(Q) = 3Q^2 - 36Q + 91 \quad (\therefore Q^0 = 1)$

When Q = 3

$MC(Q) = 3(3^2) - 36(3) + 91$

$= 3(9) - 108 + 91$

$= 27 - 108 + 91$

$= 118 - 108$

$= 10$

To find AVC

Given $TC(Q) = Q^3 - 18Q^2 + 91Q + 10$

We know TVC (Q) $= Q^3 - 18Q^2 + 91Q$ ($\therefore$constant value is fixed cost)

AVC(Q)=TVC(Q)/Q

$$\boxed{AVC(Q) = Q^2 - 18Q + 91}$$

When Q = 3

$AVC(Q) = 3^2 - 18(3) + 9$

$= 9 - 54 + 91$

$= 100 - 54 = 46$

$$\therefore AVC(Q) = \frac{Q^3 - 18Q^2 + 91Q}{Q}$$

$= Q^2 - 18Q + 91$

Note : Fixed cost= 10

Average fixed cost = $\frac{10}{Q}$.

$$\text{Average cost} = \frac{Q^3 - 18Q^2 + 91Q + 10}{Q}$$

$$= Q^2 - 18Q + 91 + \frac{10}{Q}$$

So Average cost = AVC + AFC

AC = AVC + AFC

$$AC = \frac{TC}{Q}$$

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Example: 12.20

A manufacturer estimates that, when units of a commodity are produced each month the total costs will be TC(Q) = 128 + 60Q + 8Q² Find the marginal cost, average cost, fixed cost, variable cost, average fixed cost and average variable cost.

Solution:

Given that TC(Q) = 128 + 60Q + 8Q²

We know TC = Fixed cost + variable cost

$$MC\ (Q) = \frac{d(TC)}{dQ}$$

$$= 0 + 60(1)Q^{1-1} + 8(2)Q^{2-1}$$

$$= 0 + 60Q^0 + 16Q^1 (\text{Since, } Q^0=1)$$

$$\boxed{MC = 60 + 16Q}$$

$$Average\ Cost = \frac{TC}{Q}$$

$$= \frac{128 + 60Q + 8Q^2}{Q}$$

$$AC = \frac{128}{Q} + 60 + 8Q$$

Constant value is known as fixed cost

Fixed cost = 128

FC = 128

$$\text{Average Fixed cost} = \frac{128}{Q}$$

$$AFC = \frac{128}{Q}$$

Average Variable cost =60 + 8Q (total variable cost divided by Q)

$$\therefore AVC = 60 + 8Q$$

12.4.8 Elasticity of Demand

Elasticity of Demand is the ratio of the proportionate change in quantity demanded to the proportionate change in price. In mathematical terms,

$$e_d = \left(\frac{P}{x}\right)\ \left(\frac{dx}{dp}\right)$$

In demand function Q = a–bP

$$e_d = (dQ/dP)(P/Q)$$

Example 12.21

If the demand function is $x = \frac{100}{P}$, find e_d with respect to price at the point where P = 2

Note

By taking supply function, the elasticity of supply can be calculated

Solution:

Given

$$x = \frac{100}{P} = 100P^{-1}$$

$$\therefore \frac{dx}{dp} = 100(-1)P^{-1-1}$$

$$= 100(-1)P^{-2}$$

$$= -100(P^{-2})$$

$$= \frac{-100}{P^2}$$

At P=2,

$$\frac{dx}{dp} = \frac{-100}{4} = -25 \quad \text{and} \quad x = \frac{100}{2} = 50$$

Substituting the values in formula

$$e_d = \frac{Pdx}{xdp} = \left(\frac{2}{50}\right)\left(\frac{-100}{4}\right) = \frac{-200}{200} = -1$$

$$e_d = -1$$

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12.5 Integral Calculus

12.5.1 Integration

Differential calculus measures the rate of change of functions. In Economics it is also necessary to reverse the process of differentiation and find the function F(x) whose rate of change has been given. This is called integration. The function F(x) is termed an integral or anti- derivative of the function f(x).

The integral of a function f(x) is expressed mathematically as

$$\int f(x)dx = F(x)+C$$

Here the left hand side of the equation is read "the integral of f(x) with respect to x" The symbol ∫ is an integral sign, f(x) is integrand, C is the constant of integration, and F(x)+c is an indefinite integral. It is so called because, as a function of x, which is here unspecified, it can assume many values.

12.5.2 Meaning

If the differential coefficient of $F(x)$ with respect to x is f(x), then an integral of f(x) with respect to x is F(x). It is a reverse process of differentiation. In symbols:

$$\text{If } \frac{d[F(x)]}{d_x} = f(x), \text{ then } \int f(x)dx = F(x)+C$$

Following points need to be remembered:

a. ∫ is used to denote the process of integration. In fact, this symbol is an elongated 'S' denoting sum.

b. The differential symbol 'dx' is written by the side of the function to be integrated.

c. $\int f(x)dx = F(x)+C$, C is the integral constant

$\int f(x)dx$ means, integration of f(x) with respect to x.

12.5.3 Basic Rule of Integration

(i) Power Rule $\int x^n dx = \frac{x^{(n+1)}}{n+1} + C$

(ii) $\int k.dx = kx + c$, where k is a constant

(iii) $\int a.x^n dx = a\int x^n dx$

Example 12.22

$$\int 4x^3 dx = 4\int x^3 dx$$
$$= 4\frac{x^{3+1}}{3+1} + c$$
$$= 4\frac{x^4}{4} + c$$
$$= x^4 + c$$

Example12.23

$$\int (x^2 + x - 1)dx = \int x^2 dx + \int x dx - \int dx$$
$$= \frac{x^{2+1}}{2+1} + \frac{x^{1+1}}{1+1} - x + c$$
$$= \frac{x^3}{3} + \frac{x^2}{2} - x + c$$

Example 12.24

$$\int 5dx = 5x + c$$

Example12.25

$$\int 4xdx = 4\frac{x^{1+1}}{1+1} + c$$
$$= 4\frac{x^2}{2} + c$$
$$= 2x^2 + c$$

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12.5.4 Application of Integration

Example 12.26

Let the marginal cost function of a firm be $100-10x+0.1x^2$ where x is the output. Obtain the total cost function of the firm under the assumption that its fixed cost is ₹500.

Solution

$$MC = 100 - 10x + 0.1\,x^2$$

$$TC = \int \left(100 - 10x + 0.1x^2\right) dx$$

$$= 100x - 10\frac{x^2}{2} + 0.1\frac{x^3}{3} + c$$

$$= 100x - 5x^2 + \frac{x^3}{30} + c$$

Fixed cost is given as ₹500

$$\therefore TC = 100x - 5x^2 + \frac{x^3}{30} + 500$$

$$= \frac{x^3}{30} - 5x^2 + 100x + 500$$

Example 12.27

The marginal cost function for producing x units is $y = 23 + 16x - 3x^2$ and the total cost for producing zero unit is ₹40. Obtain the total cost function and the average cost function.

Solution:

Given the marginal cost function $y = 23 + 16x - 3x^2$; $c = 40$

₹40 is the fixed cost.

We know that

Total Cost function = $\int$ (Marginal cost function) dx+c

$$TC = \int y\,dx + c$$

$$= \int (23 + 16x - 3x^2)dx + c,$$

where c is a constant

$$= \int 23dx + \int 16x dx - \int 3x^2\,dx + c$$

$$= 23x + 16\left[\frac{x^2}{2}\right] - 3\left[\frac{x^3}{3}\right] + c$$

$TC = 23x + 8x^2 - x^3 + c$

$c = 40$ given

$\therefore TC = 23x + 8x^2 - x^3 + 40$

$$\text{Average cost function} = \frac{TC}{x}$$

$$= 23 + 8x - x^2 + \frac{40}{x}$$

12.5.5 Consumer's Surplus

This theory was developed by the Alfred Marshall. The demand function P(x) reveals the relationship between the quantities that the people would buy at given price. It can be expressed as

$$P = f(x)$$

Consumer surplus is the difference between the price one is willing to pay and the price that is actually paid.

It is represented in the following diagram.

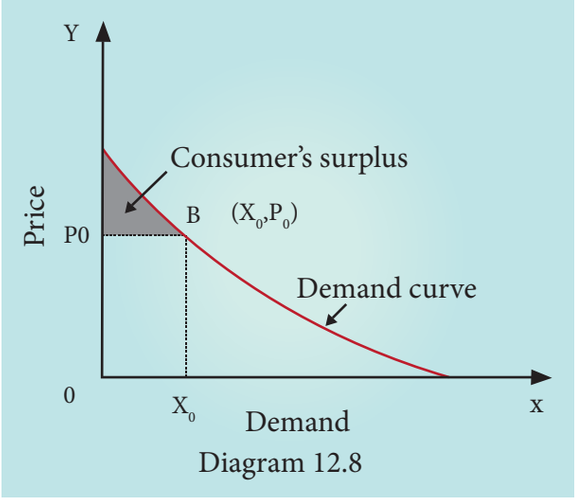


Diagram 12.8

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Mathematically, the consumer's surplus (CS) can be defined as

CS = (Area under the demand curve from $x = 0$ to $x = x_0$) – (Area of the rectangle OX_0BP_0)

$$CS = [\int_0^{x0} p(x)\,dx] - x_0p_0$$

Example:12.28

If the demand function is $P = 35 - 2x - x^2$ and the demand x_0 is 3, what will be the consumer's surplus?

Solution

Given demand function,

$$P = 35 - 2x - x^2$$

for $x = 3$

$$P = 35 - 2(3) - 3^2$$

$$= 35 - 6 - 9$$

$$P = 20$$

Therefore,

CS = (Area of the curve below the demand curve from 0 to 3) – Area of the rectangle (20 x 3 = 60)

$$CS = \int_0^3 (35 - 2x - x^2)dx - (20 \times 3)$$

$$= \left[35x - 2\frac{x^2}{2} - \frac{x^3}{3}\right]_0^3 - 60$$

$$= 35(3) - 2\left(\frac{3^2}{2}\right) - \frac{3^3}{3} - 60$$

$$= 105 - 9 - 9 - 60$$

$$= 27 \text{ Units.}$$

12.5.6 Producer's surplus

$$PS = P_o x_o - \int_o^{x_o} g(x)\,dx$$

Example 12.29

Given the demand function $P_d = 25 - Q^2$ and the supply function $P_s = 2Q + 1$. Assuming pure competition, find (a) consumers surplus and (b) producers surplus. (P_d = Demand price; P_s = Supply price)

Solution:

For market equilibrium, $P_d = P_s$

$$25 - Q^2 = 2Q + 1$$

$$0 = -25 + Q^2 + 2Q + 1$$

$$0 = -24 + Q^2 + 2Q$$

$$Q^2 + 2Q - 24 = 0$$

$$Q^2 + 6Q - 4Q - 24 = 0$$

$$Q(Q + 6) - 4(Q + 6) = 0$$

$$(Q + 6)(Q - 4) = 0$$

So, $Q = 4$ or $Q = -6$. Since Q cannot be equal to –6,

$$Q = 4$$

When Q=4, $P_d = 25 - 4^2 = 9$;

$$P_s = 2(4) + 1 = 9$$

Consumers' surplus $= \int_0^4 (25 - Q^2)dQ - (9 \times 4)$

$$= \left[25Q - \frac{Q^3}{3}\right]_0^4 - 36$$

$$= [(25)(4) - \frac{1}{3}(4)^3] - (0) - 36$$

$$= [100 - \frac{64}{3}] - (0) - 36 = 42.67$$

Producers' surplus PS

$$(PS) = (9 \times 4) - \int_0^4 (2Q + 1)dQ$$

$$= 36 - \left[(Q^2 + Q)\right]_0^4$$

$$= 36 - (16 + 4) = 16$$

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Think and Do

- Find your change in mark by additional hour of study in any of your subject
- Find your consumption of petrol for an additional unit of kilometer travelled
- Ask your parents about their spending with respect to every additional unit of wage or salary or income

12.6 Information and Communication Technology (ICT)

Information and Communication Technology (ICT) is the infrastructure that enables computing faster and accurate. The following table gives an idea of range of technologies that fall under the category of ICT.

S.No	Information	Technologies
1	Creation	Personal Computers, Digital Camera, Scanner, Smart Phone
2	Processing	Calculator, PC, Smart Phone
3	Storage	CD, DVD, Pen Drive, Microchip, Cloud
4	Display	PC, TV, Projector, Smart Phone
5	Transmission	Internet, Teleconference, Video conferencing, Mobile Technology, Radio
6	Exchange	E mail, Cell phone

The evaluation of ICT has five phases. They are evolution in

(a) Computer

(b) PC

(c) Microprocessor

(d) Internet and

(e) Wireless links

In Economics, the uses of mathematical and statistical tools need the support of ICT for data compiling, editing, manipulating and presenting the results. In general, SPSS and Excel packages are often used by researchers in economics. Such Software is designed to do certain user tasks.Word processor, spread sheet and web browser are some of the examples which are frequently used while undertaking analysis in the study of economics.

12.6.1 MS Word

MS word is a word processor, which helps to create, edit, print and save documents for future retrieval and reference.

The features of word processor are

a) Document can be created, copied, edited and formatted.

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b) Words and sentences can be inserted, changed or deleted.

c) Formatting can be applied.

d) Margins and page size can be adjusted.

e) Spell check can be availed.

f) Multiple documents – files can be merged.

How to open a word Document?

One can open MSWord from various options.

Click start → All program → MS word or Double click the MS word icon from the desktop.

Uses of Menu

Home menu	→	It is used to change the fonts, font size, change the text color and apply text style bold, italic, underline etc.
Insert	→	It is used to insert page numbers, charts, tables, shapes, word art forms, equations, symbols and pictures.
Page Layout	→	It is used to change the margin size, split the text into more columns, background colour of a page.
Reference	→	Insert table of authors, endnote, footnote
Review	→	Spell check, Grammar, Translate.
View	→	Print layout, full screen reading, document view

12.6.2 Microsoft Office Excel

It is used in data analysis by using formula. A spread sheet is a large sheet of paper which contains rows and columns. The intersection of rows and columns is termed as 'cell'. MS Excel 2007 version supports up to 1 million rows and 16 thousand columns per work sheet.

Start

You can start excel from various options.

- Click Start → Program → Micro Soft Excel.
- Double Click the MS Excel Icon from the Desk top.

Work Sheet

A worksheet is a table like document containing rows and columns with data and formula. There are four kinds of calculation operators. They are arithmetic, comparison, text concatenation (link together) and reference. MS Excel helps to do data analysis and data presentation in the form of graphs, diagrams, area chart, line chart etc.

12.6.3 Microsoft Power Point

It is a software used to perform computer based presentation.

Steps involved in making presentation:

(i) Click Start Menu

(ii) Click Program

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(iii) Select Microsoft Power point – Click.

(iv) New Power Point file will open, and then type the title and subtitle if wanted.

(v) A new slide can be inserted by 'click' on icon 'new slide' or using short key 'Ctrl + M'

(vi) We can type the content, insert the table, pictures, movies, sounds, etc., with the content.

(vii) Tab 'Design' helps to design the slides (can select common design for all slides or separate slide for each slide)

(viii) Click icon slide show, one can run slide show either starting from the first slide or starting from the current slide.

The power point presentation (PPT) facilitates the key points to be kept in memory and understand the particular topic. Recently, the smart class room teaching uses the PPT to deliver the information in an effective way to enhance the quality of teaching.



Think and Do

- Make a Document with MS word on "Incredible India".
- Prepare an Excel Sheet for your daily pocket expenses for each category/item in last month
- Prepare and present a "Power Point" for "Day out with your parents"

CONCLUSION

This chapter provide the knowledge of necessity of mathematics in economics by explaining the application of linear algebra, calculus and Information Communication and Technology. Specifically the knowledge of functions, matrices , differential calculus, Integral calculus ,MS word, MS Excel and Power Point Presentation are depicted with suitable applications. The activities are also added for students to learn it reality about the use of mathematical methods in economics.

FORMULAE

1. $m = y_2-y_1/x_2-x_1$ for Slope
2. $(y-y_1) = m\,(x-x_1)$ for straight Line
3. $|A| = \mathbf{a_1(b_2c_3 - b_3c_2) - a_2(b_1c_3-b_3c_1)+a_3(b_1c_2-b_2c_1)}$ for 3x3 matrices
4. Differentiation of constant is zero
5. Differentiation of x^n is $nx^{(n-1)}$
6. e_d = Marginal function / Average function
7. $e_d = \dfrac{-P}{x}\dfrac{dx}{dp}$
8. Integration of x^n is $\dfrac{x^{n+1}}{n+1}+C$
9. $CS=\left[\int_0^{x_0} f(x)dx\right]-x_o p_o$
10. PS = x_0p_0 – integration of supply function within limit $= x_o p_o - \int_0^{x_0} g(x)\,dx$

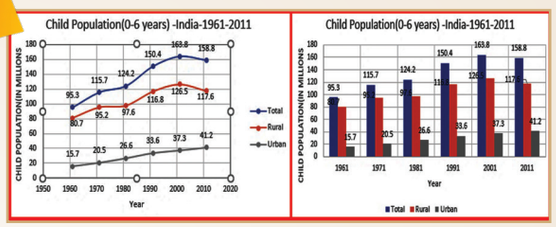
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ICT CORNER

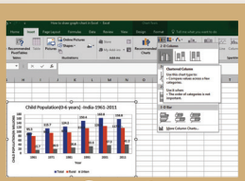
Drawing Graphs for the Data Collected

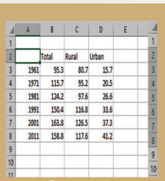
Graphs using EXCEL for the given data is given

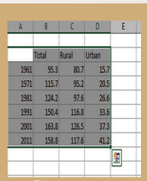


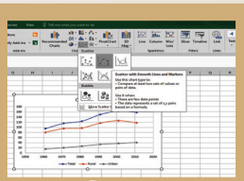
Steps:

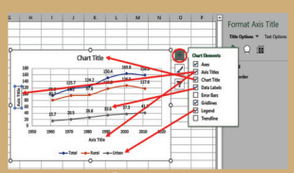
- Collection of data of Child population (0-6 years) from 1961 to 2011 in Rural and Urban areas in India. Let us draw the graph for the data.
- Open Microsoft Excel workbook, Type the X-axis data in the First column and then type respective data in consecutive columns.
- Now select all the typed data, After selecting the data Click "Insert" to get Charts. select scatter type to get scroll down menu.
- Select "Scatter with Smooth Lines and Markers" you will get the required graph as shown here.
- By selecting 3 icons on the right side to edit "chart elements" Particularly Check on the boxes Axis Titles and Chart Title.
- Type x-axis and y-Axis, followed by Chart Title. Click "Legend" to change the position
- Now right click on the graph (a) to copy the graph and Then paste in a word page (or)Select move chart to move In other excel page, Menu willappear to place it in new sheet.
- Now If you want to change the graph type as bar chart or any other type,click on the graph to select and then click on any type of graph given in the top menu

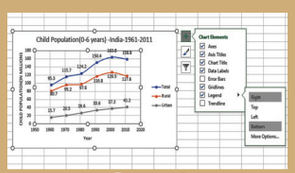

Step1

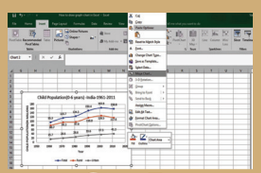

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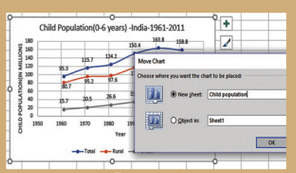

Step3


Step4


Step5


Step6


Step7


Step8

Pictures are indicatives only*

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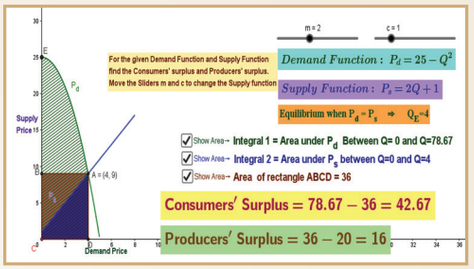
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ICT CORNER

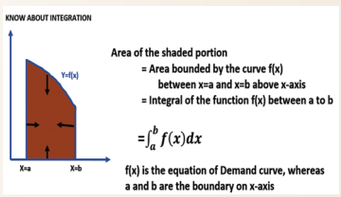
Consumer's and Producer's Surplus

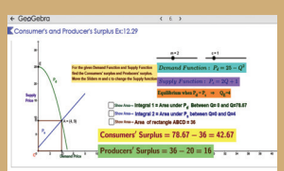
Lets use Integration to find Consumer's and Producer's Surplus

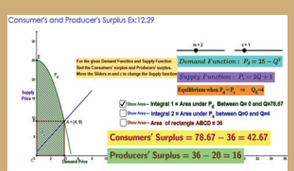


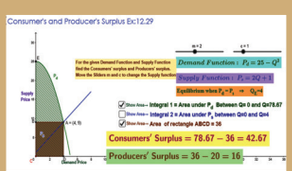
Steps:

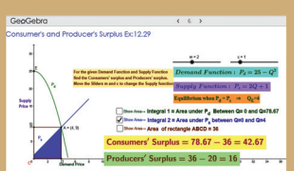
- Open the Browser type the URL given (or) Scan the QR Code.
- GeoGebra Work book called "XI STD ECONOMICS" will appear, Open the worksheet named "Consumer's and Producer's Surplus Ex:12.29"
- Without integration we cannot find the Area under the curve. For Higher studies atleast you should know what is Integration and why it is needed.
- In the worksheet Green colour is the Demand Curve and Blue colour is the Supply curve. They intersect at Point A (4,9). In which x axis value 4 is the demand price. If you integrate the Demand curve between 0 and 4 we get the area as shown. Click "Show Area Integral1" integrating the demand price between 0 and 4.
- If you click on "Show Area of Rectangle" you can see the area of the rectangle which is obtained by Multiplying the length 4 and Breadth 9 (Point A(4,9))
- If you subtract: the area under the curve PD -Area of the rectangle you get the Consumer's Surplus.
- Click on "Show Area Integral 2" you see Blue colour area which is obtained by Integrating Supply Price line between 0 and 4. Subtract: Area of the rectangle – Area under the line PS you get The Producer's Surplus. You can change PS line by moving the sliders 'm' and 'c'. you can see the changes in Consumer's Surplus and Producer's Surplus.




Step1


Step2


Step3


Step4

Pictures are indicatives only*

URL:

https://ggbm.at/ddY3wkjp

(or) scan the QR Code

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MODEL QUESTIONS

Part-A Multiple Choice Questions

1. Mathematical Economics is the integration of
   - **a.** Mathematics and Economics
   - **b.** Economics and Statistics
   - **c.** Economics and Equations
   - **d.** Graphs and Economics

2. The construction of demand line or supply line is the result of using
   - **a.** Matrices
   - **b.** Calculus
   - **c.** Algebra
   - **d.** Analytical Geometry

3. The first person who used mathematics in Economics is
   - **a.** Sir William Petty
   - **b.** Giovanni Ceva
   - **c.** Adam Smith
   - **d.** Irving Fisher

4. Function with single independent variable is known as
   - **a.** Multivariate Function
   - **b.** Bivariate Function
   - **c** Univariate Function
   - **d.** Polynomial Function



5. A statement of equality between two quantities is called
   - **a.** Inequality
   - **b.** Equality
   - **c.** Equations
   - **d.** Functions

6. An incremental change in dependent variable with respect to change in independent variable is known as
   - **a.** Slope **b.** Intercept
   - **c.** Variant **d.** Constant

7. $(y - y_1) = m(x - x_1)$ gives the
   - **a.** Slope
   - **b.** Straight line
   - **c.** Constant
   - **d.** Curve

8. Suppose D = 50 − 5P. When D is zero then
   - **a.** P is 10 **b.** P is 20
   - **c.** P is 5 **d.** P is −10

9. Suppose D = 150 − 50P. Then, the slope is
   - **a.** −5 **b.** 50
   - **c.** 5 **d.** −50

10. Suppose determinant of a matrix $\Delta = 0$, then the solution
    - **a.** Exists
    - **b.** Does not exist
    - **c.** is infinity
    - **d.** is zero

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11. State of rest is a point termed as

a. Equilibrium

b. Non-Equilibrium

c. Minimum Point

d. Maximum Point

12. Differentiation of constant term gives

a. one

b. zero

c. infinity

d. non-infinity

13. Differentiation of x^n is

a. $nx^{(n-1)}$

b. n x $^{(n+1)}$

c. zero

d. one

14. Fixed Cost is the ----------term in cost function represented in mathematical form.

a. Middle

b. Price

c. Quantity

d. Constant

15. The first differentiation of Total Revenue function gives

a. Average Revenue

b. Profit

c. Marginal Revenue

d. Zero

16. The elasticity of demand is the ratio of

a. Marginal demand function and Revenue function

b. Marginal demand function to Average demand function

c. Fixed and variable revenues

d. Marginal Demand function and Total demand function

17. If x+y = 5 and x–y= 3 then, Value of x

a. 4

b. 3

c. 16

d. 8

18. Integration is the reverse process of

a. Difference

b. Mixing

c. Amalgamation

d. Differentiation

19. Data processing is done by

a. PC alone

b. Calculator alone

c. Both PC and Calculator

d. Pen drive

20. The command **Ctrl** + **M** is applied for

a. Saving

b. Copying

c. getting new slide

d. deleting a slide

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Part-A Answers

1	2	3	4	5	6	7	8	9	10
a	d	b	c	c	a	b	a	d	b
11	12	13	14	15	16	17	18	19	20
a	b	a	d	c	b	a	d	c	c

Part – B Answer the following questions in one or two sentences:

21. If $62 = 34 + 4x$ what is x? (Answer :x is 7)

22. Given the demand function $q = 150 - 3p$, derive a function for MR.

23. Find the average cost function where $TC = 60 + 10x + 15x^2$

24. The demand function is given by $x = 20 - 2p - p^2$ where p and x are the price and the quantity respectively. Find the elasticity of demand for $p = 2.5$.

25. Suppose the price p and quantity q of a commodity are related by the equation $q = 30 - 4p - p^2$ find (i) e_d at $p = 2$ (ii) MR

26. What is the formula for elasticity of supply if you know the supply function?

27. What are the Main menus of MS Word?

Part – C Answer the following questions in one paragraph:

28. Illustrate the uses of Mathematical Methodsm in Economics.

29. Solve for x quantity demanded *if* $16x - 4 = 68 + 7x$. (Ans: x is 8)

30. A firm has the revenue function $R = 600q - 0.03q^2$ and the cost function is $C = 150q + 60{,}000$, where q is the number of units produced. Find AR, AC, MR and MC. (Answersa:AR = 600 – 0.03q ; MR = 600 – 0.06 q; AC = 150 + (60000/q))

31. Solve the following linear equations by using Cramer's rule.

$x_1 - x_2 + x_3 = 2$: $x_1 + x_2 - x_3 = 0$: $-x_1 - x_2 - x_3 = -6$

32. If a firm faces the total cost function $TC = 5 + x^2$ where x is output, what is TC when x is 10?

33. If $TC = 2.5q^3 - 13q^2 + 50q + 12$ derive the MC function and AC function.

34. What are the steps involved in executing a MS Excel Sheet?

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Part – D Answer the following questions in about a page:

35. A Research scholar researching the market for fresh cow milk assumes that $Qt = f(Pt, Y, A, N, Pc)$ where Qt is the quantity of milk demanded, Pt is the price of fresh cow milk, Y is average household income, A is advertising expenditure on processed pocket milk, N is population and Pc is the price of processed pocket milk .

(a) What does $Qt = f(Pt, Y, A, N, Pc)$ mean in words?

(b) Identify the independent variables.

(c) Make up a specific form for this function. (Use your knowledge of Economics to deduce whether the coefficients of the different independent variables should be positive or negative.)

36. Calculate the elasticity of demand for the demand schedule by using differential calculus method $P = 60 - 0.2Q$ where price is (i) zero, (ii) ₹20, (iii) ₹40.

37. The demand and supply functions are $p_d = 1600 - x^2$ and $p_s = 2x^2 + 400$ respectively. Find the consumer's surplus and producer's surplus at equilibrium point.

38. What are the ideas of information and communication technology used in economics?

ACTIVITY

1. The petrol consumption of your car is 16 Kilometers per litre. Let x be the distance you travel in Kilometers and p the price per litre of petrol in Rupees. Write expressions for demand for Petrol.
2. Make up your own demand function and then derive the corresponding MRfunction and find the output level which corresponds to zero marginal revenue.
3. Use an Excel spreadsheet to calculate values for Quantity of demand at various prices for the function Q = 100−10P then plot these values on a graph.
4. Open MS-Word and put the title as **PRESENT AND ABSENT OF STUDENTS** and insert the table and collect the data for all classes of your school and find the class of highest absentees in a month. Justify with reason for the absentees in a paragraph by using MS Word.

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   https.researchgate.net/mathematical economics

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GLOSSARY

Accelerator	முடுக்கி
Advertising elasticity of demand	விளம்பரத் தேவை நெகிழ்ச்சி
Alternative uses	மாற்றுப் பயன்கள்
Annual plan	ஓராண்டுத் திட்டம்
Art	கலை
Assumption	அனுமானம் / ஊகம்
Average cost	சராசரிச் செலவு
Average product	சராசரி உற்பத்தி
Barter	பண்டமாற்று
Behavioural Economics	மனப்போக்கு சார் பொருளியல்
Business	வணிகம்
Capability	செயலாற்றல்
Capital	மூலதனம் (K)
Cardinal Utility Analysis	இயல்பெண் பயன்பாட்டு ஆய்வு
Cash Reserve Ratio (CRR)	ரொக்க இருப்பு வீதம்
Characteristics	பண்புகள் / இயல்புகள்
Child sex Ratio	6 வயதுக்குக் கீழே உள்ள 1000 ஆண் குழந்தைகளுக்கு எத்தனை பெண் குழந்தைகள் இருக்கிறார்கள் என்பது குழந்தைகளின் பாலின விகிதம்
Classical	தொன்மை
Coefficient	கெழு
Colonial capitalism	குடியேற்ற ஆதிக்க முதலாளித்துவம்
Concealed unemployment, Disguised unemployment	மறைமுக வேலையின்மை
Concentration	செறிவு
Constant Returns to Scale	மாறா விளைவு விகித அளவு
Consumer	நுகர்பவர்
Consumer's Surplus	நுகர்வோர் உபரி / நுகர்வோர் எச்சம்
Consumption	நுகர்வு (C)
Contraction of demand	(விலை அதிகரிப்பால் நிகழ்வு) தேவைச்சுருக்கம்
Criticism	திறனாய்வு
Crop insurance	பயிர் காப்பீடு
Cross elasticity of demand	குறுக்கு தேவை நெகிழ்ச்சி
Crude Birth rate	ஓராண்டில் 1000 பேர்களுக்கு பிறந்த குழந்தைகளின் எண்ணிக்கை
Crude Death Rate	1000 பேர்களில் இறந்தவர்களின் எண்ணிக்கை
Data /Statistics /information	புள்ளி விவரங்கள்
Decentralization	பரவலாக்கப்படல்
Decrease in demand	தேவை குறைதல்
Deductive Method	பகுத்தாய்வு முறை
Definition	வரையறை / இலக்கணம்
Delicensing	உரிமம் விலக்கல்
Demand	தேவை

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Democracy	குடியாட்சி
Demographic dividend	மக்கள் தொகையின் நன்மைகள் / பயன்கள்
Demonstration effect	பகட்டு விளைவு
Density of population	மக்கள் தொகை அடர்த்தி என்பது மொத்த மக்கள் தொகையை நிலத்தின் அளவால் வகுக்கக் கிடைப்பது ஆகும்
Determinants	நிர்ணயிப்பவை
Determinant	அணிக்கோவை
Development Economics	மேம்பாட்டுப் பொருளியல்
Development	மேம்பாடு
Differential calculus	வகை நுண்கணிதம்
Diminishing Returns to Scale	குறைந்து செல் விளைவு விகித அளவு
Diseconomies of Scale	சிக்கனமின்மைகள்
Disinvestment	பொதுத்துறைச் சொத்துகளை விற்றல்
Dismal Science	இருண்ட அறிவியல்
Distribution	பகிர்வு
Division of labour	வேலைப்பகுப்பு
Domain	சார்பகம்
Dualism	இரு வேறுபட்ட குணங்கள் காணப்படும் நிலை / தன்மை. எ.கா. மாட்டு வண்டியும், SUV மகிழ் உந்து வண்டியும்
Duopoly	இருவர் முற்றுரிமை (இரண்டு விற்பனையாளர்கள் மட்டும்)
Dynamic	இயங்கு நிலை/ இயக்கம்
Economics	பொருளியல்
Economies of scale	அளவுச் சிக்கனங்கள்
Economy	பொருளாதாரம்
Elasticity of demand	தேவை நெகிழ்வு /தேவை நெகிழ்ச்சி
Elasticity of Supply	அளிப்பு நெகிழ்வு / நெகிழ்ச்சி
Empowerment	வலிமை பெறுதல் / அதிகாரமளித்தல்
Enterprise	நிறுவனம்
Entrepreneurship	தொழில் முயலும்தன்மை
Entrepreneur	தொழில் முயல்வு / முயற்சி
Environmental Economics	சுற்றுச்சூழல் பொருளியல்
Equal- Marginal utility	சம–இறுதி நிலைப் பயன்பாடு
Equation	சமன்பாடு
Equilibrium	சமநிலை
Ethical	அறநெறி சார்ந்த
Exchange	பரிமாற்றம்
Expansion of demand	விலை குறைவால் நிகழ்ந்த தேவை விரிவு
Explicit cost	வெளிப்படையான செலவு
Export promotion zone	ஏற்றுமதி ஊக்குவிப்பு மண்டலம்
Export	ஏற்றுமதி (X)
External Diseconomies	புறச்சிக்கனமின்மைகள்
External Economies of Scale	பொருளாதார புறச்சிக்கனங்கள்
Factors of Production	உற்பத்திக் காரணிகள்
Factors	காரணிகள்
Facts	உண்மைகள், எண்களினாலான விவரங்கள்
Famine	பஞ்சம்
Features	சிறப்பியல்புகள்
Finance Capital	நிதி மூலதனம்

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Financial Economics	நிதிப் பொருளியல்
Fiscal reforms	அரசுநிதிச் சீர்திருத்தங்கள்
Fixed cost	மாறாச் செலவு
Floating cost	மிதக்கும் செலவு
Foreign Capital	வெளிநாட்டு மூலதனம்
Frictional unemployment	உடன்பாடில்லா வேலையின்மை (வேலை மாற்றுத் தடையால் பெறப்படும் வேலையின்மை.)
Gender equality	பாலினச் சமத்துவம்
General equilibrium	பொதுச்சமநிலை
Globalization	உலகமயமாக்குதல்
Goods / Products/ Commodities / things	பண்டங்கள் /சரக்குகள்/பொருட்கள்
Goods and Services Tax(GST)	பண்டங்கள் மற்றும் பணிகள் வரி (அல்லது) சரக்கு மற்றும் சேவை வரி
Gross sown Area	விதைக்கப்பட்ட மொத்த நிலப்பரப்பு, ஒரு ஏக்கர் நிலத்தில் இரண்டு போகம் பயிரிட்டால் அது இரண்டு ஏக்கராகக் கணக்கிடப்படும்
Government Spending	அரசுச் செலவு (G)
Green revolution	பசுமைப்புரட்சி
Gross National Happiness Index	நாட்டு மகிழ்ச்சி மொத்தக் குறியீடு
Gross state domestic Product	மாநில மொத்த உள்நாட்டு உற்பத்தி
Growth	வளர்ச்சி
Health Economics	உடல் நலப் பொருளியல்
Human Development Index	மனித வள மேம்பாட்டுக் குறியீடு
Human welfare	மனித நலம்
Hypothesis	கருதுகோள்
Imitation	போலி செய்தல்
Imperfect competition	நிறைகுறைப் போட்டி
Implicit cost	மறைமுகச் செலவு
Import	இறக்குமதி (M)
Income elasticity of demand	வருமானத் தேவை நெகிழ்ச்சி
Income	வருமானம்
Increase in demand	தேவை கூடுதல்
Increasing Returns to Scale	வளர்ந்து செல்விகித அளவு
Index	குறியீடு
Indicators	குறிகாட்டிகள்
Indifference curve	சம நோக்கு வளைகோடு
Indifference Map	சம நோக்கு வரைபடம்
Indifference schedule	சம நோக்கு அட்டவணை
Inductive Method	விதிவருமுறை, தொகுத்தாய்வு முறை
Industrialization	தொழில் மயமாதல்
Industrial Policy resolution	தொழிற்கொள்கை தீர்மானம்
Infant Mortality Rate (IMR)	பச்சிளங்குழந்தை இறப்பு விகிதம் (1000 குழந்தைகளில் ஒரு வயதை முடிக்கும் முன்புஇறக்கும் குழந்தைகளின் விகிதம்)
Innovation	புத்தாக்கம், புதியன புனைதல்
Integral calculus	தொகை நுண்கணிதம்
Interest rate	வட்டிவீதம் (i)
Internal Economies of Scale	பொருளாதார அகச் சிக்கனங்கள்
Investment	முதலீடு
Invisible hand	புலனாகா உந்துசக்தி
Involuntary unemployment	வேலைக்குத் தயாராக இருந்தும் வேலை கிடைக்காத நிலை (தன் விரும்பா வேலையின்மை)

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Iso- quants	சம அளவு உற்பத்திக் கோடுகள்
Labour	உழைப்பு
Land Tenure	நில உடைமை முறை
Land use pattern	நிலத்தை பயன்படுத்தும் விதம்
Law of variable proportions	மாறும் விகித விளைவு விதி
Laws of Returns to Scale	விகித அளவு விளைவு விதி
Liberalization	தாராள மயமாக்குதல்
Life Expectancy at Birth	வாழ்நாள் எதிர்பார்ப்பு காலம்
Linear Equation	நேர்க்கோட்டுச் சமன்பாடு
Liquidity preference	நீர்மை விருப்பம்
Literacy Ratio	மொத்த மக்கள் தொகையில் எழுதப்படிக்க தெரிந்தவர்களின் விகிதம்
Long – run	நீண்ட காலம்
Macro – Economics	பேரினப் பொருளியல் / பேரியல் பொருளியல்
Mahalwari system	குழு உரிமை முறை (இதில் கிராமக் குழுக்கள் நிலத்தை நிர்வாகம் செய்து நிலத் தீர்வையை அரசுக்கு செலுத்தவேண்டும்)
Management	மேலாண்மை
Marginal cost	இறுதிநிலைச் செலவு
Marginal product	இறுதிநிலை உற்பத்தி
Marginal Rate of substitution	இறுதி நிலை பதிலீட்டு வீதம்
Marginal Rate of Technical Substitution	இறுதிநிலை தொழில்நுட்பப் பதிலீட்டு வீதம்
Marginal utility	இறுதி நிலைப் பயன்பாடு
Market	அங்காடி / சந்தை
Material wealth	பருப்பொருட் செல்வம்
Maternal Mortality Rate (MMR)	மகப்பேறுக் கால இறப்பு விகிதம் (ஒரு லட்சம் தாய்மார்களில் மகப்பேறின்போது இறக்கின்ற பெண்களின் எண்ணிக்கை)
Matrix / Matrices	அணி / அணிகள்
Merchant Capital	வணிக மூலதனம்
Micro, small and medium Enterprises	குறு, சிறு மற்றும் நடுத்தர நிறுவனங்கள்
Micro-Economics	நுண் பொருளியல் / நுண்ணினப் பொருளியல்/
Migration	குடி பெயர்தல் / புலம் பெயர்தல்
Modern age	நவீனயுகம்
Monetary Reforms	பணச் சீர்திருத்தங்கள்
Money Cost	பணச் செலவு
Monopolistic competition	முற்றுரிமைப் போட்டி (ஒரு பொருளை சிறிது வேறுபாடு செய்து பலர் விற்பார்கள்)
Monopoly	முற்றுரிமை (ஒரே ஒரு விற்பனையாளர்)
Morbidity Rate	உடல் நலமின்மை விகிதம்
MRTP ACT	முற்றுரிமை வணிகக் கட்டுப்பாட்டுச் சட்டம் (Monopoly and Restrictive Trade Practies ACT)
Multiplier	பெருக்கி
National Income	நாட்டு வருமானம் (y)
Nationalization	நாட்டுடைமையாக்குதல்
Need	உயிர்பிழைக்க அடிப்படைத் தேவை
Neo – classical	புதிய தொண்மை வழி
Net sown Area	விதைக்கப்பட்ட நிகர நிலப் பரப்பு, இது விதைக்கப்பட்ட மொத்த நிலப்பரப்புக்குச் சமமாகவோ குறைவாகவோ இருக்கும்
NITI Aayog	இந்தியாவை மாற்றுவதற்கான தேசிய அளவிலான நிலையத்திற்கான திட்டம்
Nominal income/Money income	பெயரளவு வருமானம்/பணவருமானம்

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Non renewable Energy sources	புதுப்பிக்க இயலாத சக்தி வளங்கள்
Normative Science	நெறியுரை அறிவியல்
Oligopoly	சில்லோர் முற்றுரிமை
Opportunity cost	வாய்ப்புச் செலவு
Organisation	அமைப்பு
Particular / partial equilibrium	தனிச் சமநிலை / பகுதிச் சமநிலை
Per capita income	தலைவீத வருமானம் (மொத்த தேசிய வருமானத்தை மொத்த மக்கள் தொகையால் வகுக்க கிடைப்பது)
Perfect Competition	நிறைவுப் போட்டி
Physical quality of life index	வாழ்க்கைத் தரக் குறியீடு
Plan Holiday	திட்ட விடுமுறை (1966 முதல் மூன்று ஆண்டுகளுக்கு ஐந்தாண்டுத் திட்டங்கள் செயல்படுத்த இயலவில்லை)
Point of inflexion / point of inflection	மாறும் விகிதம் மாறுகின்ற புள்ளி
Political Economy	அரசியல் பொருளாதாரம்
Positive Science	இயல்புரை அறிவியல்
Poverty	வறுமை
Price determination	விலை நிர்ணயம் /விலை தீர்மானம்
Price discrimination	விலைப்பேதம்
Price Elasticity of demand	விலைத்தேவை நெகிழ்ச்சி
Price line	விலைக்கோடு
Prime cost	முதன்மைச் செலவு
Privatization	தனியார் மயமாக்குதல்
Producer's Equilibrium	உற்பத்தியாளர் சமநிலை
Producer's Surplus	உற்பத்தியாளர் உபரி /உற்பத்தியாளர் எச்சம்
Production Possibility curve	உற்பத்தி வாய்ப்பு வளைகோடு
Production Possibility Frontier	உற்பத்தி வாய்ப்பு எல்லை
Production Possibility Schedule	உற்பத்தி வாய்ப்புப் பட்டியல்
Production	உற்பத்தி
Public Economics	பொதுப் பொருளியல்
Public Finance	பொது நிதி
Public sector enterprises	பொதுத்துறை நிறுவனங்கள்
Quasi – rent	போலி வாரம்
Quotation	மேற்கோள்
Rational	பகுத்துணரவல்ல
Real Cost	உண்மைச் செலவு
Real income	உண்மை வருமானம் (பணவருமானத்தின்வாங்கும் சக்தி)
Rectangular Hyperbola	செவ்வக அதிபர வளைவு
Redeemable Energy	புதுப்பிக்க கூடிய சக்தி வளங்கள்
Regional development	வட்டார மேம்பாடு
Rent	வாரம்
Repo rate Repurchase Rate	மைய வங்கியிடமிருந்து பிற வங்கிகள் பெறும் குறுகிய காலக் கடன் வட்டி வீதம் (RR>RRR) மைய வங்கி பெறும் வட்டிவீதம்
Reserve Requirements	ஒதுக்கீட்டு விகித அளவுகள் (வங்கிகள் வைத்திருக்க வேண்டிய வைப்புகள்)
Resources	வளங்கள்
Revenue	வருவாய்
Reverse Repo Rate (RRR)	வங்கிகள் மைய வங்கியிடம் வைத்திருக்கும் குறுகிய கால வைப்புகளுக்கு மைய வங்கி தரும் வட்டிவீதம் (RR>RRR)
Risk bearing	இடர் தாங்குதல்

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Risk	இடர்
Rolling Plan	சுழல் திட்டம் (1978 – 79 ஆம் ஆண்டு மட்டும் இத்திட்டம் நடைமுறையில் இருந்தது)
Ryotwari system	உழுபவர் உரிமை முறை (இதில் நிலத்தை உழுபவரே நிலச் சொந்தக்காரராக இருப்பார்)
Savings	சேமிப்பு (S)
Scale	அளவுகோல்
Scarcity	கிடைப்பருமை : அளிப்பு <தேவை
Scope	எல்லை
Secularism	மதச்சார்பின்மை
Self – Help Groups	சுய உதவிக் குழுக்கள் (பொதுவாக 10 முதல் 20 பெண்களைக் கொண்டவை)
Services	பணிகள் / சேவைகள்
Sex ratio	பாலின விகிதம் (1000 ஆண்களுக்கு எத்தனை பெண்கள் என்பது)
Shift in demand curve	தேவை வளைகோடு இடப்பெயர்வு
Short –run	குறுகிய காலம்
Skewed distribution	சமமற்ற பரவல்
Slope	சாய்வு
Social Cost	சமூகச் செலவு
Social Infrastructure	சமூகக் கட்டமைப்பு எ.கா. கல்வி மற்றும் மருத்துவ நிறுவனங்கள்
Social justice	சமூக நீதி
Special Economic Zone	சிறப்புப் பொருளாதார மண்டலம்
Static equilibrium	நிலையான சமநிலை
Statutory Liquidity Ratio(SLR)	சட்டப்படியான நீர்மை வீதம்
Structural unemployment	அமைப்பு சார் வேலையின்மை
Sunk cost	அமிழ்த்தப்பட்டச் செலவு, மீண்டும் திரும்பப் பெற முடியாத செலவு
Super Multiplier	மிகைப் பெருக்கி
Supply	அளிப்பு
Tangible	தொட்டுச் செல்லும் / தொட்டுணரச் கூடிய
Tax	வரி (T)
Theories	கோட்பாடுகள்
Total cost	மொத்தச் செலவு
Total product	மொத்த உற்பத்தி
Trade /international trade	வணிகம்
Uncertainty	நிலையின்மை
Urbanisation	நகர் மயமாதல்
Utility	பயன்பாடு
Util	அலகு
Values	மதிப்பீடுகள் / விழுமியங்கள்
Value	மதிப்பு
Variable cost	மாறும் செலவு
Variable	மாறி
Voluntary unemployment	வேலை கிடைத்தும் வேலைக்குச் செல்லாமல் இருப்பது தன் விருப்ப வேலையின்மை ஆகும்
Wants	விருப்பங்கள்
Y intercept	y அச்சை வெட்டும் இடம்
Zamindari system	நிலக்கிழார் முறை (இதில் நிலக்கிழார் நிலத் தீர்வையை வசூலித்து அரசுக்கு செலுத்தவேண்டும்)

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