Senior Secondary Course

ECONOMICS (318)

2

Course Coordinator
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NATIONAL INSTITUTE OF OPEN SCHOOLING

Chairman's Message

Dear learner,

As the needs of the society in general, and some groups in particular, keep on changing with time, the methods and techniques required for fulfilling those aspirations also have to be modified accordingly. Education is an instrument of change. The right type of education at right time can bring about positivity in the outlook of society, attitudinal changes to face the new/fresh challenges and the courage to face difficult situations.

This can be very effectively achieved by regular periodic curriculum renewal. A static curriculum does not serve any purpose, as it does not cater to the current needs and aspirations of the individual and society.

For this purpose only, educationists from all over the country come together at regular intervals to deliberate on the issues of changes needed and required. As an outcome of such deliberations, the National Curriculum Framework (NCF 2005) came out, which spells out in detail the type of education desirable/needed at various levels of education - primary, elementary, secondary or senior secondary.

Keeping this framework and other national and societal concerns in mind, we have currently revised the curriculum of Economics course at Senior Secondary level, as per the Common Core Curriculum provided by National Council of Educational Research and Training (NCERT) and the Council of Boards of School Education in India (COBSE) making it current and need based. Textual material production is an integral and essential part of all NIOS programmes offered through open and distance learning system. Therefore, we have taken special care to make the learning material user friendly, interesting and attractive for you.

I would like to thank all the eminent persons involved in making this material interesting and relevant to your needs. I hope you will find it appealing and absorbing.

On behalf of National Institute of Open Schooling, I wish you all a bright and successful future.

Prof. C.B. Sharma
Chairman, NIOS

A Note From the Director

Dear Learner,

The Academic Department at the National Institute of Open Schooling tries to bring you new programmes every now and then in accordance with your needs and requirements.

The Economics course at Senior Secondary level has now been revised as per the Common Core Curriculum developed by COBSE (Council of Boards of School Education) and NCERT (National Council for Educational Research and Training) making it current and need based.

The National Curriculum Framework developed by the National Council for Educational Research and Training was kept as a reference point. Leading expertsin the subject of the country were involved and with their active involvement, study materials based on the new curriculum have been updated.

Old, outdated information has been removed and new, relevant things have been added.

I am happy to place this new revised study material in Senior Secondary Economics in your hand. I hope you will find the new material that is now in your hands interesting and exciting. Any suggestions for further improvement are welcome.

Let me wish you all a happy and successful future.

(Dr. Kuldeep Agarwal)
Director (Academic)
National Institute of Open Schooling

A Letter to Learner

Dear Learner

I welcome you all to this Senior Secondary Course in Economics. It gives me immense pleasure that you have opted Economics as one of your subjects of study. The study of economics contributes to the development of systematic framework for analyzing, researching and writing about a wide array of financial and regional economic issues and also making sense of our complex environment.

An earnest attempt has been made to revise this book as per Common Core Curriculum developed by COBSE (Council of Boards of School Education) and NCERT (National Council for Educational Research and Training) making it current and need based.

The present curriculum in Economics has been distributed into two parts and eleven modules.

Part I Consists of three modules, namely: Indian Economic Development, Current challenges before the Indian Economy and Economic growth and Economic Development. Similarly Part-II consists of eight modules, namely: Statistical Tools, Introduction to Economics, Consumer's Behaviour, Producer's Behaviour, Market and Price Determination, National Income Accounting, Theory of Income and Employment and money, Banking and Government Budget. Each module has been divided further into different lessons.

All efforts have been made to give related illustrations and examples for your better understanding. You should go through all solved examples and try to solve all problems under "Check Your Progress" and "Terminal Exercise" independently given at the end of each lesson.

If you face any difficulty, please do not hesitate to write to me. Your suggestions and doubts are most welcome.

Wish you a bright future!

Yours,

Dr. Manish Chugh
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How to use the Study Mate-

Your learning material has been developed by a team of economics experts in open and distance learning. A consistent format has been developed for self-study. The following points will give you an idea on how to make best use of the print material.

Title is an advance organisor and conveys an idea about the contents of the lesson. Reflect on it.

Introduction highlights the contents of the lesson and correlates it with your prior knowledge as well as the natural phenomena in operation in our immediate environment. Read it thoroughly.

Objectives relate the contents to your desired achievements after you have learnt the lesson. Remember these.

Content of the lesson has been divided into sections and sub-sections depending on thematic unity of concepts. Read the text carefully and make notes on the side margin of the page. After completing each section, answer intext questions and solve numerical problems yourself. This will give you an opportunity to check your understanding. You should continue reading a section till such time that you gain mastery over it.

At some places you will find some text in **italics and bold**. This indicates that it is important. You must learn them.

Intext Questions are based on the concepts discussed in every section. Answer these questions yourself in the space given below the question and then check your answers with the model answers given at the end of the lesson. This will help you to judge your progress. If you are not satisfied with the quality and authenticity of your answers, turn the pages back and study the section again.

What have you learnt is essentially summary of the learning points for quick recapitulation. You may like to add more points in this list.

Terminal exercises in the form of short, long and numerical question will help you to develop a perspective of the subject, if you answer these meticulously. Discuss your responses with your peers or counsellors.

Answers to intext questions : These will help you to know how correctly you have answered the intext questions.

Audio: For understanding difficult or abstract concepts, audio programmes are available on certain content areas. You may listen to these on FM Gyanvani or may buy the CDs from Priced Publication Unit, NIOS

Video: Video programmes on certain elements related to your subject have been made to clarify certain concepts. You may watch these at your study center or may purchase these CDs from Priced Publication Unit, NIOS.

www These are few selected websites that you can access for extended learning.

Studying at a distance requires self-motivation, self-discipline and self-regulation. Therefore you must develop regular study habit. Drawing a daily schedule will help you in this endeavour. You should earmark a well-ventilated and well-lighted space in your home for your study.

Course Overview

Part I: [For Tutor Marked Assignment]

Module-I: Indian Economic Development

1. Overview of Indian Economy

2. Economic Planning in India

Module-II: Current Challenges before the Indian Economy

3. Economic Growth and Economic Development

4. The Problem of Unemployment, Poverty and Inequality

Module-III: Introduction to Statistics

5. Meaning, Scope and its Need in Economics

6. Collection and Classification of Data

7. Presentation of Data

Important Note: All contents of Part-I will be assessed/examined through Tutor Marked Assignment (TMA). TMA is compulsory and contains 20% marks as weightage. The marks/grades of TMA will be reflected in the mark sheet.

Part-II [For Public Examination]

Module IV: Statistical Tools

    8. Measures of Central Tendencies

    9. Measures of Dispersion

    10. Correlation Analysis

    11. Index Numbers

Module V: Introduction to Economics

    12. Introduction to the study of Economics

    13. Central Problems of an Economy

Module VI: Consumer's Behaviour

    14. Consumer's Equilibrium

    15. Demand

    16. Price Elasticity of Demand

Module VII: Producer's Behaviour

    17. Production Function

    18. Cost of Production

    19. Supply

    20. Price Elasticity of Supply

Module VIII: Market and Price Determination

    21. Forms of Market

    22. Price Determination Under Perfect Competition

    23. Revenue and Profit Maximization of a Competitive Firm

Module-IX: National Income Accounting

    24. National Income and related Aggregates

    25. National Income and its Measurement

Module X: Theory of Income and Employment

    26. Consumption, Saving and Investment

    27. Theory of Income Determination

Module XI: Money, Banking and Government Budget

    28. Money and Banking

    29. Government and the Budget

Important Note: All Contents of Part-2 will be assessed/examined through Public/ Final Examination. Public Examination is compulsory and contains 80% marks as weightage.

Contents

MODULE - V
INTRODUCTION TO ECONOMICS

Notes

12

INTRODUCTION TO THE STUDY OF ECONOMICS

Economics is a vast subject encompassing various topics related to production, consumption, saving, investment, inflation, employment and unemployment, national income, international trade, quality of life, fiscal policy, monetary policy etc so on and so forth. The list is unending. From the point of view of better understanding of the subject and finding a solution to the problem, it is imperative to know the nature of the economic issue under study and the area or branch under which the issue is dealt with.

OBJECTIVES

After completing this lesson, you will be able to:

- understand the meaning of economics;
- distinguish between positive and normative economics;
- differentiate between micro and macroeconomics and highlight their components;
- examine the significance of microeconomics and macroeconomics; and
- relate the interdependence of microeconomics and macroeconomics.

12.1 MEANING OF ECONOMICS

The term 'Economics' is derived from two Greek words **OIKOS and NEMEIN,** meaning the rule or law of the household. Economics therefore is concerned with not just how a nation allocates its resources to various uses but it ideals with the process by which the productive capacity of these resources can be further

Notes

increased and with the factors which in the past have led to sharp fluctuations in the rate of utilization of resources. British economist Robbins has defined economics as follows:

"Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses.

Robbins definition is comprehensive in explaining the scope of Economics. It is the problem of 'choice' which is all pervasive in areas of consumption, production and exchange. For example, a consumer has to choose that combination of goods which yields maximum satisfaction. Similarly, a firm has to choose that size of output which ensures maximum profit. **Nobel Laureate Prof. Samuelson has spelled out Economics as follows:**

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

12.2 POSITIVE VS NORMATIVE ECONOMICS

While discussing the issues related to the economic conditions and trying to find solutions to economic problems, economists often talk about positive and normative nature of these issues. Positive economics deals with economic analysis which are based on facts and statistical data. When an economic phenomenon is being described with statistical support, then we call it positive economics. So positive economics relates to the phenomenon of 'what is'. On the other hand, normative economics deals with the issue of 'what ought to be'. Normative economics is based on value judgement and debate which are required to arrive at some conclusion. Issues related to framing policies for the society, mostly come under normative economics. Take the example of the issue of India's population. It is the fact that as per 2011 census, India's population was around 121 crore. Since it is based on data, the statement relates to positive economics. But when we discuss about the problems faced due to population pressure, economists and policy makers recommend several solutions such as 'India should control its population by adopting family planning' etc. such a thing comes under normative economics because these can be debate on this policy. There are lot of economic problems faced by the citizens and the economy as a whole. Data are required to justify that a problem exists which is part of positive economics. When we try to find solutions to the problem then value judgements are made and debates take place which comes under normative economics.

INTEXT QUESTIONS 12.1

1. Identify the following statements as positive on normative.

   (i) Government should provide unemployment benefit to the unemployed youths.

   (ii) 27 per cent of India's population belongs to poor sections of the society.

   (iii) India should take loan from world bank to create more infrastructure.

   (iv) RBI should increase the bank rate to curb inflation.

   (v) RBI has increased the bank rate to 6 percent.

Notes

12.3 MICROECONOMICS VS MACROECONOMICS

Modem economics is studied in two parts- Microeconomics and Macroeconomics. Micro means small. So, when the study or the problem relates to an individual unit or part of the economy then the subject of study is micro economics. Macro means large. When the study relates to the whole economy or to aggregates relating to the whole economy then the subject of study is macro economics.

Microeconomics

Microeconomics is the study of economic activity of an economic unit or a part of the economy or a small group of more than one unit. Derived from the Greek word *micros* meaning small, it relates to the individual economic agent's behaviour and the result of such interactions in determining the price of goods and services.It is, thus, also called Price Theory.

It is the microscopic study of the economy which deals with decision making by any individual, firm,household with respect to matters of production, consumption, determination of prices in the market,determination of wage rate, and so on. The aim is to provide a framework within which the behaviour patterns and interrelationships between individual economic units can be studied and their behaviour with regards to production, exchange and distribution of goods and services can be predicted. Thus, attainment of a state of equilibrium from the point of view of individual economic units is the main aim in microeconomic analysis.

Further, micro economics also puts emphasis on behaviour patterns and role of firms and individuals in income distribution and study of conditions of efficiency in production and attainment of overall efficiency. Efficiency implies optimum allocation of resources among the consumers and producers so that there is neither excess demand nor excess supply of goods and services. The analysis of the three central problems of an economy- what goods and services to be produced, how to produce them and how they can be distributed in the economy are all subject matter of micro economics.

Notes

INTEXT QUESTIONS 12.2

Which one of the following statements is correct?

(a) Determination of price of agood

(b) What goods to be produced

(c) Bothe (a) and (b)

(d) Only (a)

Macroeconomics

Macroeconomics is the branch of economics that deals with the economic aggregates of a country as a whole. The word macro is derived from the Greek word *macros* meaning large. It has emerged after the British economist John Maynard Keynes published his famous book *The General Theory of Employment, Interest and Money* in 1936. The Great Depression of 1929 made economists think about the subject in a newer way which was holistic and macroeconomic study developed. It is also called the Theory of Income and Employment.

The content of macroeconomic analysis involves a combination of units to get a complete picture of the economic system so as to deal with economic affairs at a large scale. The focus areas are aggregate economic variables of an economy. The components of output, price level and employment operate in an economy simultaneously which indicates that they bear a close relationship with each other. This forms the basis of macroeconomic study which attempts to analyse these attributes together. It sees the economy as a combination of four components- households, firms, government and external sector.

The study area involves the analysis of effects in the market of taxation, budgetary policies, policies on money supply, role of state, rate of interest, wages, employment, and output. It is, therefore, also called *income theory* as it is concerned with the economy as a whole and seeks to study the causes and solutions for economic issues such as unemployment, inflation, balance of payment deficits and so on.

INTEXT QUESTIONS 12.3

1. Give the name of the book authored by Keynes?

2. Which of the following is the subject matter of macro economics?

   (a) Wage rate   (b) monopoly

   (c) inflation   (d) market price.

12.4 INTERDEPENDENCE OF MICRO AND MACROECONOMICS

Micro economics and macro economics are two parts of economics but they are not mutually exclusive. In other words, they are interrelated. A close interlink exists between macro and micro economics. All micro economic studies can help in better understanding and analysis of the macro economic variables. Such studies also help in the formulation of economic policies and programmes. As you know that the changes and processes in an economy are a result of a variety of large and small scale elements which have a capacity to affect each other and are also affected by each other. For example, increased taxes are a macroeconomic decision but their impact on savings of a firm is microeconomic analysis. Further, how this saving impacts the economy is a macroeconomic analysis.

Take another example. If we know how the price of a commodity is determined and understand the role of buyers and sellers in the process of price determination, it would help us in analysing the changes that take place in the general price level for all the commodities as a whole in the economy. A study of the process of price determination and the role of buyers and sellers in this process is a micro economic study, whereas the study of the general price level in the economy is a macro economic study. Similarly, if we want to assess the performance of an economy, we will have to find out the performance of each sector of the economy and to find out the performance of each sector we will have to find out the performance of each production unit individually or in groups. A study of each group of production unit or of each sector is a micro economic study whereas the study of all the production units or all the sectors taken together is a macro economic study. Thus, micro economics and macro economics are two interrelated parts of economics.

Therefore, the study of both is indispensable in economic study.

12.5 DIFFERENCES BETWEEN MICRO AND MACRO ECONOMICS

Significant differences exist between the two branches in the following ways:

(i) Differences in the scale of study

Macroeconomics is related to the study of the aggregate while microeconomics relates to the individual economic agents

(ii) Differences in the field of study

Macroeconomic analysis is concerned with the broadest level of policies pertaining to income, employment and growth of resources while microeconomics is

Notes

concerned with problems and policies relating to the optimum allocation of resources and economic activities such a price determination.

(iii) Differences in importance given to price and income concepts

Microeconomic analysis focuses on price determination in the market for goods and serviceswhile macroeconomics focuses on income determination in the economy as a whole.Every good and service has its market where buyers and sellers interact with one another to determine its price and quantity. Since decisions are taken by the individual buyers who demand the goods and the sellers who supply the goods, it forms the part of micro economics. On the other hand, determination of income of the entire economy involves mobilisation of resources by all the sectors of the economy taken together. So it forms the part of macro economics.

(iv) Differences in the methods of study

Microeconomic study is dominated by the method called Partial Equilibrium Analysis which is focussed on significant factors related to an economic activity. Under macroeconomics, the mutual dependence of important economic aggregates is studied and this is called Quasi General Equilibrium Analysis.

(v) Differences in Analytical Factors

Microeconomics deals with the study of the behaviour of economic variables in an equilibrium position while macroeconomic analysis deals with the study of the behaviour of.economic aggregates in a disequilibrium position.

INTEXT QUESTIONS 12.4

State whether the following statements are true or false:

1.   Micro economics studies the aggregates of the economy.

2.   Macro economics deals with partial equilibrium analysis.

3.   Macro economics addresses the issue of unemployment in the economy.

4.   Economic policies are studied under micro economics.

12.6   SIGNIFICANCE OF MACRO AND MICRO ECONOMICS

Both the branches of economic analysis are complementary and supplementary to each other. The applied aspects of these relate to the fields of economics and

commerce. The significant areas of microeconomic analysis lie in agricultural economics, labour economics, international economics, consumer economics, comparative economics, welfare economics, regional economics, aspects of public finance and other fields.Macroeconomic studies are applied in the fields of formulation and execution of economic policies, understanding microeconomics, studying economic development, welfare studies, inflation and deflation studies and international comparisons as well.

Notes

WHAT YOU HAVE LEANT

● Positive economics relates to the phenomenon of 'what is' which is based on facts.

● Normative economics deals with the issue of 'what ought to be' and is based on value judgement.

● Microeconomics is the study of economic activity of an economic unit or a part of the economy or a small group of more than one unit.

● macroeconomics is a branch of economics that studies the aggregates or economy as a whole.

● All macroeconomic studies can help in better understanding and analysis of the microeconomic variables. Such studies also help in the formulation of economic policies and programmes.

● Significant differences between microeconomics and macroeconomics are:

   (i)   differences in scale of study,

  (ii)   differences in the field of study,

 (iii)   differences in the importance given to price and income concepts,

  (iv)   differences in the methods of study,

   (v)   differences in the assumption,

  (vi)   differences in analytical factors.

TERMINAL EXERCISE

1. Define macroeconomics.
2. Define microeconomics.
3. What is the significance of the study of microeconomics?
4. Explain the difference between microeconomics and macroeconomics.

5. What are the fields of study in microeconomics and macroeconomics.

6. What is the significance of study of macroeconomics?

7. Distinguish between positive and normative economics with examples.

ANSWERS TO INTEXT QUESTIONS

12.1

(i) Normative

(ii) Positive

(iii) Normative

(iv) Normative

(v) Positive

12.2

(c) both (a) and (b)

12.3

1. General theory of employment interest and Money

2. (c) Inflation

12.4

1. False

2. False

3. True

4. False

13

CENTRAL PROBLEMS OF AN ECONOMY

Economics is about how people make decisions given their limited resources. The decisions are taken with regard to the basic economic activities such as production and consumption of goods and services and saving and investment. However, taking decision is not easy or simple. One must estimate the wants and the availability of resources while taking decisions on production of goods and services. Similarly distribution of the produced goods in the society needs to be done properly. The basic problems central to any economy, therefore, relate to production, consumption and distribution.

OBJECTIVES

After completing this lesson, you will be able to:

- explain the causes of economic problems;
- identify the central problems: 'what to produce', 'how to produce' and 'for whom to produce';
- understand the concept of production possibility frontier curve;
- explain the concepts of opportunity cost and marginal opportunity cost; and
- describe the central problems of an economy by using the production possibility curve.

13.1 WHY DO ECONOMIC PROBLEMS ARISE

The economic problem arises in every economy due to

(a) Unlimited wants

(b) Limited resources

(c) Alternative uses of resources.

Notes

(a) Unlimited Wants

Human beings are required to satisfy their basic needs for their survival. For example, a person needs food, water, clothing and shelter in order to survive. These are the basic needs of a person. However, no person would like to satisfy only his/her basic needs if he/she could improve his/her life. People, by nature, want more than what they just need for survival. If one want is satisfied, many others crop up and this goes on endlessly.

Let us understand this through an example. Suppose Neha wants some food, a blouse, utensil for her mother, sweets for her brother, and bangles. These may be only a few of the many things that Neha may like to have if she had some money. This example shows that an individual's wants are unlimited.

(b) Limited Resources

Let us say that all the things said above are available at some price. Now suppose that Neha has only ₹ 1000 with her to spend. Let food is available at ₹ 150, a blouse costs ₹ 200, value of utensil is ₹ 600, a packet of sweet costs ₹ 200 and a set of bangles is available at ₹ 50. All these taken together would cost Neha ₹ 1200. Since she has only ₹ 1000 with her, Neha has to adjust her purchases accordingly. Here, we say that the means to satisfy Neha's wants are limited to ₹ 1000. People may have high or low income but not unlimited income. Hence, resources (or income) available to consumers are scarce or limited.

Resources also include factors of production: land, labour, capital and entrepreneurship. These resources are not available in abundance in this world. They are scarce or limited. Scarcity means that the demand for the resources is greater than their availability.

(c) Alternative Uses of Resources

The above example also highlights another important fact that a resource can be used in different ways. In Neha's case, she can use her ₹ 1000 to buy some items. Once she chooses to buy something (for example utensil for her mother) then she can not satisfy her other wants. Similarly, all factors of production can be put to alternative uses. For example, a piece of land can be used to do farming, build a factory, develop a school or build a hospital. A labour can be used to plough a field, to make baskets or to sell vegetables. Hence, we see that resources have alternative uses.

Notes

From the above discussion we can see that wants are unlimited but resources (to satisfy the wants) are limited which happens to be the basic economic problem faced by all economies. We have also discussed that resources have alternative uses. This basic problem exists in every economy - whether rich or poor; developed or developing.

Scarcity of resources also leads to choice. In our example, Neha has only ₹ 1000 to spend but she wants to buy many things which was limited. So she must choose what she wants. In this way a consumer tries to solve the economic problem of unlimited wants and limited resources. Similarly producers also face the economic problem as they need to decide as to which alternative use should they put their scarce resources.

Suppose resources were not limited. Would it still lead to the economic problem? The answer to this question is that if resources were not scarce they could be used to satisfy all wants. Hence, the basic problem of scarcity and choice would not arise. Scarcity of resources results in people making decisions about how best they would like to use these limited resources. Making the best use of resources is termed as e**conomizing of resources**. Economizing of resources does not mean being miserly about using resources, but using resources judiciously so that maximum benefit can be obtained from the scarce resources.

INTEXT QUESTIONS 13.1

State whether the following statements are true or false:

1. Resources are scarce.

2. Wants are limited.

3. Scarcity does not lead to choice.

4. Resources have alternative uses.

5. Every economy does not face the basic economic problem.

6. Economizing of resources means being miserly about using resources.

7. Land is a factor of production.

8. Human wants are unlimited.

9. Resources are scarce if demand is less than its availability.

10. Only producers face economic problems.

Notes

13.2 CENTRAL PROBLEMS OF ECONOMY

As we have discussed above, every economy in the world faces the economic problem of unlimited wants and limited resources. This economic problem gives rise to people making choices about how they would like to use scarce resources. This economic problem gives rise to the central problems of an economy which are as following

- What to produce and in what quantities?
- How to produce?
- For whom to produce?

These are called central problems because every economy has to face them and seek solutions to them.

Collectively, these central problems are called **the Problem of Allocation of Resources.**

Let us discuss each of these central problems in detail

(a) What to produce and in what quantities?

The fact that resources are scarce leads to the problem of 'what to produce' and in what quantities to produce. An individual producer needs to decide on how to employ the sources that are available to her for production. For example, if Lata, a farmer has a piece of land, she needs to think about what crop she would like to produce on her land. Let us assume taht she can grow either sugarcane or wheat. Given that her land is limited, she needs to choose whether she wants to use the land to produce sugarcane or wheat or both. Once Lata has taken this decision she needs to think about the quantity of the crop that she would like to produce. For example, 10 quintals, 20 quintals or 50 quintals.

This problem of 'what to produce' and in what quantities to produce is faced by all economies. An economy needs to choose whether it wants to use its resources to produce consumer goods or producer goods. Alternatively, to what extent should luxury goods be produced in comparison to necessities or goods of mass consumption? An economy may also be faced with the question of how much of civilian goods to be produced and how much of defence goods to be produced. In other words, scarce resources require economies to decide the combination of goods and services they should produce.

The problem of what to produce and in what quantities to be produced can be solved by a government that decides the allocation of resources in different areas of production. Alternatively, it can be solved based on the preferences of people in an economy and on the price of goods and services in market.

Notes

(b) How to produce?

Choosing the technique of production relates to the problem of 'how to produce'. By technique of production we mean the different combination of factors of production that can be used to produce a good.

Generally all goods can be produced through different methods of production. Various methods of production require different combinations of factors of production. A technique of production could be either labour intensive or capital intensive. *In a production process when more units of labour are used in proportion to capital, it is termed as a labour intensive technique. Alternatively, when the proportion of capital used is more than labour, the production process is called a capital intensive technique.*

Let us understand this with the help of some examples. On Lata's farm, she has the choice of using different combinations of labour and capital to produce her crop. If she chooses to do the ploughing, sowing, harvesting and threshing with her bullocks and employing people, then she is using a labour intensive technique. On the other hand, if she uses machines such as tractor, harvester and thresher to do the same work, then she is using a capital intensive technique of production. Similarly, in cloth production the use of handlooms is a labour intensive technique to produce cloth whereas the use of powerlooms is a capital intensive technique of production of cloth.

The solution of the problem of how to produce is based on the extent of output that is produced for a given level of resources. Any producer would like to maximize the level of output from the available resources. At the same time cost of using a technique is equally very important. A producer will use that particular technology which is available at least cost.

(c) For whom to produce?

The problem of 'for whom to produce' relates to how the value of the produced output of an economy gets distributed amongst different people. People do not receive the output they produce as their compensation. The output is sold and the money is earned in the production process. This money is paid as income to people for the work they have done in the production process. This income, in turn, is used by people to satisfy their wants. Hence, the problem of for whom to produce tells us how the different factors of production are compensated for their work.

In our example, once Lata's crop is harvested and sold, she needs to pay the various factors of production for their services. The labour will be paid wages, land will be paid rent, capital (in the form of machinery) will be paid interest. Lastly, Lata will earn profit as an entrepreneur for organising the factors of production and undertaking some risk of running the produciton activity.

Notes

INTEXT QUESTIONS 13.2

Choose the correct answer:

1. The problem of how to produce relates to:
   (a) distribution of income
   (b) technique of production
   (c) choosing the goods to produce
   (d) choosing the quantities to produce

2. The problem of what to produce is solved by:
   (a) preferences of people
   (b) market prices
   (c) government allocation of resources
   (d) all of the above

3. The income earned by labour in the production process will be part of the problem of:
   (a) what to produce and what quantities
   (b) how to produce
   (c) for whom to produce
   (d) none of the above

4. Labour intensive technique of production means:
   (a) the use of only labour in production
   (b) production unit is owned by labour
   (c) the technique used for producing necessities
   (d) the use of more labour than capital in producing goods

5. The central problems facing an economy relates to:
   (a) the allocation of resources
   (b) what to produce
   (c) how to produce
   (d) for whom to produce

13.3 OTHER CENTRAL PROBLEMS OF THE ECONOMY

In addition to the central problems discussed in the previous section, every economy faces two other problems. These are:

Notes

(a)   The problem of optimum utilization of resources

(b)   The problem of growth of resources

Let us discuss each of these problems in detail.

(a) Optimum Utilization of Resources

Resources are scarce they must not be wasted. They must also be used judiciously to give the maximum output. Thus, optimum utilization of resources has the following implications:

(i)   All resources must be utilized and

(ii)   Resources must be used efficiently

These two issues are discussed below:

(i) *All resources must be utilized*

If resources are not utilized/employed or are lying idle, it means that they are being wasted. Wastage of resources results in low output. For example, people may be unemployed. This means that human resources are being wasted. Similarly, when workers in a factory go on strike, capital resources lie idle and are wasted. If these resources are utilized, the output that can be produced in the economy shall rise. Thus, every economy must ensure that scarce resources are utilized and not left idle or unemployed.

(ii) *Efficient Utilization of resources*

Since resources are scarce, they should not be under utilized. Under utilization of resources means that resources are not being used to their fullest capacity. For example, if a person finds a job in which he works only for 4 hours a day, but his capacity to work is 8 hours a day, then his labour is under utilized. In other words, the person is not being employed efficiently. If he had a job for 8 hours a day, the output would increase. Under utilization of resources also results in wastage of resources. Hence, every economy must try and adopt techniques of production that ensure efficient utilization of resources.

(b) Growth of resources

We have studied earlier in the chapter that wants are unlimited. This means that people continuously want more and more goods. However, these ever increasing wants can not be satisfied unless the resources that produce goods and services are increased. Thus, resources must grow to satisfy the constantly increasing wants in an economy. So, how can resources grow in an economy? Resources can increase if:

(i) *There are quantitative changes in the resources*

Quantitative increase in resources occurs when the actual quantity of resources that is available in the economy increases. For example, when the population increases, then the quantity of human resource increases. Similarly, when more natural resources are found, it increases the availability of resources in an economy.

(ii) *There are qualitative changes in resources*

Qualitative changes in human capital occur due to better training and skill development. Qualitative changes in man made capital occur when there is an improvement in technology. Under qualitative changes, the amount of resources available does not change but their productivity increases. Productivity is defined as the output per unit of input. For example, if labour gets trained, then the output from the same person can increase. Productivity improves due to better skill and training.

To conclude our discussion, growth of resources occurs when the physical availability of resources increases and/or there is technological upgradation or an improvement in the quality of resources.

INTEXT QUESTIONS 13.3

Choose the correct answer:

1. Under utilization of resources means that resources are being used .... (efficiently/inefficiently)

2. Technological .... (backwardness/improvement) leads to growth of resources.

3. Resources should remain .... (idle/fully utilised).

4. If a person is .... (employed/unemployed), it means that the resource is being wasted.

5. Quantitative change in resources means that .... (there is more laboour available/ labour gets more skill and training).

13.4 CONCEPT OF PRODUCTION POSSIBILITIES

In deciding 'what to produce' and how much, an economy has to take decisions regarding allocation of resources among different possible alternatives. Let us assume that the economy is producing only two commodities, rice and bicycles. With the limitation of the total resources, if all the resources are utilized in the production of rice, let 20 quintals of rice can be produced and no production of

Notes

bicycle will take place. If more and more resources are being diverted towards the production of bicycles, little amount will be left for the production of rice. Similarly if all the resources are being used in the production of bicycles, say 150 bicycles can be produced and no resources will be left for the production of rice. Therefore, the scarce resources are employed in various combinations to get alternative production possibilities.

The production possibilities curve is a graphical medium of highlighting the central problem of 'what to produce'. To decide what to produce and in what quantities, it is first necessary to know what is obtainable. The curve shows the options that are obtainable, or simply the production possibilities. What is obtainable is based on the following assumptions:

- The resources available are fixed.
- The technology remains unchanged.
- The resources are fully employed.
- The resources are efficiently employed.

The resources are not equally efficient in production of all products. Thus, if resources are transferred from production of one good to another, the cost of production may increase.

13.5 PRODUCTION POSSIBILITY SCHEDULE

To simplify, let us assume that only two goods are produced in an economy. Let these two goods be guns and butter. The example given by a famous economist Samuelson who won nobel prize in economics in the year 1969. The example, symbolizes the problem of choice between war goods and civilian goods. Given the extremes and the in-between possibilities, a schedule can be prepared. It can be called a production possibilities schedule. A Production Possibilities Schedule (or Table) is a set of numbers in tabular form that illustrates different possible combinations of two goods that can be produced if all available resources are efficiently used during a given time given technology of production. Suppose if all the resources are engaged in the production of guns, there will be a maximum amount of guns that can be produced per year. Let it be 15 units. At the other extreme suppose all the resources are employed in production of butter only. Let the maximum amount of butter that can be produced is 5 units. These are the two extreme possibilities. In between the resources can also be partly used for the production of guns and partly for production of butter. Given the extremes and the in-between possibilities, a schedule can be prepared. It can be called a production possibility schedule (PPS). Let the schedule be given as follows.

Notes

Possibilities	Guns (units)	Butter (units)	MRT
A	15	0	–
B	14	1	4
C	12	2	2
D	9	3	3
E	5	4	4
F	0	5	5

13.6 PRODUCTION POSSIBILITIES CURVE/FRONTIER

The central problems of an economy are explained by modern economists with the help of Production Possibility Schedule (PPS) or Production Possibility Curve (PPC). PPS shows alternative production possibilities of two sets of goods with the given resources and techniques of production. PPC is a graphic representation of PPS. It is also called Production Possibility Frontier (PPF). This curve is also called Transformation Curve since it indicates that if more of butter is to be produced, then factors will have to be withdrawn from the production of guns and transferred towards the production of butter.
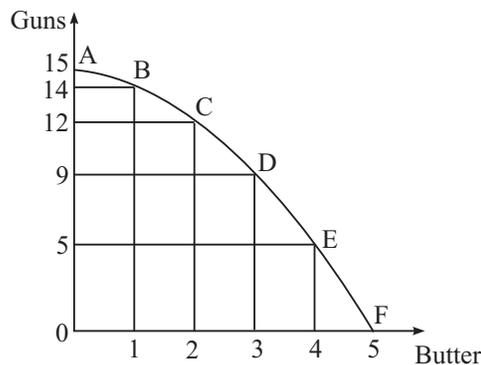
Fig. 13.1

In Fig. 13.1 the curve AF is called PPC. As shown in the diagram, when all the resources are used for production of guns only the economy produces 15 units of guns and no butter. This is marked as point A. When some resources are transferred to increase production of butter from 0 to 1 unit, then production of gun fall from 15 to 14 so that the economy reaches at point B on PPC and so on. Finally all resources are transferred from guns to produce only butter, then the economy reaches at point F, where it produces 5 units of butter and no gun. This way the

Notes

locus ABCDEF gives the PPC. So PPC is a graphical representation of the alternative combinations of the amounts of two goods or services that an economy can produce by transferring resources from one good or service to the other. This curve helps in determining what quantity of a nonessential good or a service an economy can afford to produce without jeopardizing the required production of an essential good or service. PPC has two following properties:

(a) PPC slopes downward: This means that more of a good can be produced only by sacrificing some quantity of the other good.

(b) PPC is concave to the point of origin: You can see that some amount of gun has to be reduced to produce one unit extra of butter. This is done by transferring resources from the produciton of gun to that of butter. The rate at which the units of a good is reduced to increase a unit of another good is called marginal rate of transformation (MRT). MRT is measured along PPC when the economy moves from one point to another. In Fig. 13.1, movement from point A to B to C and so on gives the idea of MRT. When the economy moves from point A to B, 1 unit of gun is reduced (from 15 units to 14 units) to produce extra unit of butter (from 0 to 1 unit). When the economy moves from point B to C, 2 units gun are given up (from 14 to 12 units) to produce another unit of butter (from 1 to 2 units). This way some units are guns are reduced to gain one unit of butter. So MRT measures the change in one good (here gun), due to change in another good (here butter).

Hence MRT measures the rate of change of PPC or simply the slope of PPC. On a concave shaped PPC as in Fig. 13.1, we see that when we increase butter by one unit, we have to decrease gun by more units than before. So on a concave PPC, MRT increases.

$$\text{Here MRT} = \frac{\text{Change in Guns}}{\text{One unit change in Butter}}$$

The curve is based on the following assumptions:

(a) quantity of factors of production is fixed

(b) full employment

(c) technology is given

(d) There are two goods produced in the economy.

PPC can be a straight line if production is obtained under law of constant returns or when marginal rate of transformation of both the commodities is same. For e.g. to produce one more unit of commodity X if only one unit of commodity Y is sacrificed through out then PPC becomes a straight line. However, this is only a conceptual possibility. The significance of this curve lies in the interpretation of the central problems and help in finding solutions to them. This is done through

Notes

analysing the output with changing combination of resources. Situation of economic growth can also be analysed through the shifts in PPC as observed after growth in capital stock, changes in investment and improvement in technology.

INTEXT QUESTIONS 13.4

State whether the following statements are true or false:

1. A point on the PPC implies that resources are fully utilised.

2. A point inside the PPC implies existence of under employment.

3. A PPC is drawn on the assumption that resources of the economy are increasing.

13.7 UNDERUTILISATION OR INEFFICIENT UTILIZATION OF RESOURCES

We have seen above that any point on the production possibility curve represents full and efficient utilization of resources. If, however, the economy functions at a point inside the production possibility curve, then it shows that there exists either underutilization or inefficient utilization of resources.
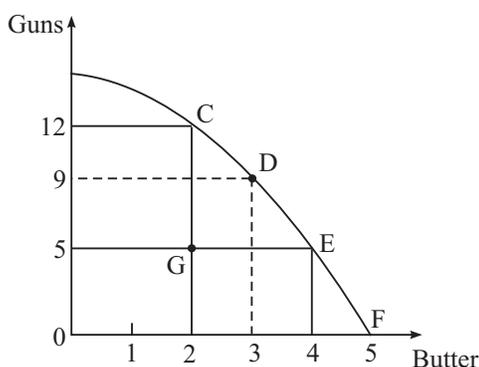
Fig 13.2 : Underutilisation or inefficient utilization of resources

Refer to our schedule of PPL given earlier.

Let us understand this point with the help of a diagram given in Fig. 13.2. In Fig. 13.2, we see that at point G, the economy is producing 2 units of butter and 5 units of guns. Through a re-allocation of resources, the economy can do one of the following:

(a) increase the production of guns to 12 units and keep the production of butter at the same 2 units as at point C on PPC.

(b) increase the production of butter to 4 units and keep the production of guns same at 5 units as shown at point E on PPC.

In both (a) and (b) above, we see that the economy has been able to increase the production of the one of the goods if it moves towards point C or E on PPC from the point G which is inside PPC.

(c) In fact the economy can produce more of both the goods on any point on PPC (e.g. at point D) as compared to point G.

Therefore, we can conclude that at point G the economy was not using its available resources in the best possible manner. So any point inside the PPC shows unemployment of resources.

13.8 GROWTH OF RESOURCES

We have studied earlier that resources in any economy need to grow to satisfy the ever increasing wants of people. Growth of resources occurs when the physical quantum of resources increases or when there is a rise in the productivity level of resources. This implies that with growth in resources, the output produced in an economy will increase. We can use the diagram in Fig. 13.2 to show growth in produciton capacity.
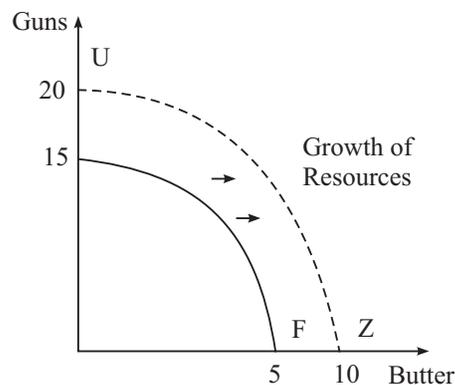
Fig. 13.3 : Production Possibility Curve showing Growth of Resources

In Fig. 13.3, we see that AF is the same production possibility curve as in Fig. 13.l. As resources grow, the economy can now produce more of both guns and butter. This is depicted by the curve UZ. At point U, the economy produces only guns which has increased to 20 units. This is more than the output of gun at point A. Similarly, at point Z, when the production of gun is zero, the output of butter is 20 units. This is greater than the output of 5 units when resources had not grown. All other output combinations show that the output of both guns and butter are higher on the production possibility curve UZ than on the curve AF. This shows that

Notes

growth of resources results in an outward shift of the production possibility curve, which results in higher levels of output.

INTEXT QUESTIONS 13.5

1. Choose the correct answer:

   A point on the production possibility curve shows:

   (i) Growth of resources

   (ii) Inefficient utilization of resources

   (iii) Unemployment of resources

   (iv) Full and efficient utilization of resources

2. State whether the following statement, are true or false:

   (a) A point inside the production possibility curve shows underutilization of resources.

   (b) Unemployment of labour means that resources are not being fully employed.

   (c) Better technology will lead to an inward shift of the production possibility curve.

   (d) A production possibility curve can depict more than two goods in an economy.

   (e) An economy needs to choose the point at which it wishes to operate on the production possibility curve, as all points are equally efficient.

WHAT YOU HAVE LEANT

- Scarcity of resources leads to the problem of choice.
- The basic economic problem is faced by both consumers and producers.
- The economic problem gives rise to the central problems in an economy. These are also termed as the problem of allocation of resources.
- The problem of what to produce and in what quantities to produce looks at the different combinations of goods and services that an economy could produce given the available resources which must be used efficiently.
- The problem of how to produce looks at choosing the best technique of production. This could be either labour intensive or capital intensive.
- The problem of 'For whom to produce' looks at how is the output produced in the economy distributed amongst the owners of different factors of production which have helped to produce the output.

- The production possibility curve shows the different combinations of two goods that can be produced with full and efficient utilization of given resources and a given state of technology.

- Any point on the PPC shows resources are being fully and efficiently used.

- Any point inside the PPC shows that resources are being underutilized or are unemployed or are lying idle.

- A growth of resources is reflected by an outward shift of the PPC.

Notes

TERMINAL EXERCISE

1. How do economic problems arise? Would there be any economic problem if resources were unlimited?

2. Explain how scarcity leads to choice.

3. Using examples explain the problem of what to produce and in what quantity.

4. Discuss the problem of 'how to produce'?

5. Explain the problem of fuller utilization of resources.

6. How can resources grow in an economy?

7. What is a production possibility curve? Using a production possibility curve show the problem of inefficient utilization of resources.

8. Draw a production possibility curve that shows growth of resources. How does growth of resources affect the output of an economy?

9. Discuss the problems of what and how to produce?

10. Draw a concave PPC by drawing a schedule?

11. Using a PPC explain inefficient utilisation of resources?

12. Using a PPC explain growth of resources?

13. Using a PPC explain efficient utilisation of resources?

14. Give three examples each about microeconomics and macroeconomics?

ANSWERS TO INTEXT QUESTIONS

13.1

1. True	2. False	3. False	4. True	5. False
6. False	7. True	8. True	9. False	10. False

Notes

13.2

1. (b)   2. (d)   3. (c)   4. (d)   5. (a)

13.3

1. inefficiently   2. improvement   3. fully utilized

4. unemployed   5. there is more labour available

13.4

1. True   2. True   3. False

13.5

1. (iv)

2. (a) True   (b) True   (c) False   (d) False   (e) True

MODULE - VI
CONSUMER'S BEHAVIOUR

14

CONSUMER'S EQUILIBRIUM

We buy many goods and services to satisfy our wants. Using up of goods and services to satisfy wants is called consumption and the economic agent who buys goods and services is called a consumer. When a consumer buys any good or service, his/her main objective is to get maximum satisfaction from the quantity of the commodities purchased by spending his/her income at the given market price. How does a consumer maximize his/her satisfaction from spending his/her income on various goods and services is the subject matter of this chapter.

OBJECTIVES

After completing this lesson, you will be able to:

- understand the meaning of consumer's equilibrium;
- understand the meaning of utility, marginal utility and total utility;
- understand the relationship between total utility and marginal utility;
- explain the law of diminishing marginal utility;
- explain consumer's equilibrium, based on utility analysis;
- understand the meaning of indifference curve, indifference map, budget line, budget set and marginal rate of substitution; and
- derive consumer's equilibrium using indifference curve and budget line.

14.1 MEANING OF CONSUMER'S EQUILIBRIUM

Equilibrium means a state of rest from where there is no tendency to change. A consumer is said to be in equilibrium when he/she does not intend to change his/her level of consumption i.e., when he/she derives maximum satisfaction. Thus, **consumer's equilibrium refers to a situation where the consumer has achieved**

maximum possible satisfaction from the quantity of the commodities purchased given his/her income and prices of the commodities in the market. As the resources are scarce in relation to unlimited wants, a consumer has to follow some principles or laws in order to attain the highest level of satisfaction.

There are two main approaches to study consumer's equilibrium. They are as follows:

1. Cardinal utility approach (or Marshall's utility analysis)

2. Ordinal utility approach (or indifference curve analysis)

14.2 CARDINAL UTILITY APPROACH

The theory of consumers behaviour by using utility approach was first given by the noted economist Alfred Marshall.

Before discussing how a consumer attains equilibrium , we need to understand the concept of utility, marginal utility and total utility.

(i) Utility

Utility is defined as the power of a commodity to satisfy a human want. Utility of a commodity is the total amount of psychological satisfaction that a person gets from consumption of a good or service, e.g. a thirsty person derives satisfaction from drinking a glass of water. So a glass of water has got utility for the thirsty person. Utility differs from person to person. Utility is subjective and cannot be measured quantitatively. Yet for the sake of convenience it is measured in 'utils'. Marshall suggested that the measurement of utility should also be done in monetary terms by converting 'util' into money by using the following formula Utility in Money = Utility in Util/Utility of a rupee. Utility of rupee can be assumed to be any number such as 1, 2, 3 ... . Let utility of a rupee is assumed to be 2 utils. Then 10 utils = $\dfrac{10}{2}$ = ₹ 5.

(ii) Marginal Utility (MU)

Marginal utility is the addition to the total utility derived from the consumption of an additional unit of a commodity. It can also be defined as the utility from the last unit of a commodity consumed. Let us explain the concept of marginal utility with the help of an example. Suppose, a consumer gets total utility of 10 utils from consumption of one orange and 18 utils from two oranges. He gets 8 utils from consumption of second orange. So, marginal utility of second orange is 8 utils. If total utility derived from three oranges is 24 utils then marginal utility of

three oranges is 6 utils (i.e. 24-18 utils). In this case third orange is the last orange. Thus marginal utility of 3 oranges is 6 utils. Marginal utility can be calculated by the following formula:

$$MU_n = TU_n - TU_{n-1}$$

or $$MU = \frac{\Delta TU}{\Delta X}$$

Notes

Where MU_n = Marginal utility of nth unit of the commodity

TU_n = Total utility of n units

TU_{n-1} = Total utility of n–1 units

X_n = Quantity of nth unit of good X

X_{n-1} = Quantity or (n–1)th unit of good X

"n" takes the values 1, 2, 3, ...

(iii) Total utility

Total utility is the total satisfaction obtained from the consumption of all possible units of a commodity. For example, if the first orange gives you a satisfaction of 10 utils, second one gives you 8 utils and third one gives you 6 utils, then total utility from three oranges = 10 + 8 + 6 = 24 utils. Total utility can be obtained by summing up marginal utilities from consumption of different units of a commodity. Thus, total utility can be calculated as:

$$TU_n = MU_1 + MU_Z + MU_3 + ... MU_n$$

or $$TU_n = \Sigma MU$$

where, TU_n = Total utility from n units of a given commodity

MU_1, MU_2, MU_3, MU_n = Marginal utilities from 1st, 2nd 3rd and nth unit of the commodity

14.3 RELATIONSHIP BETWEEN TOTAL UTILITY AND MARGINAL UTILITY

The relationship between total utility and marginal utility is explained with the help of following table 14.1 and Fig. 14.1.

Table 14.1

Units of Oranges Consumed	Marginal Utility (Utils)	Total Utility (Utils)	
0	–	0	TU increases at diminishing rate (MU is positive)
1	10	10	
2	8	18	
3	6	24	
4	2	26	
5	0	26	TU is maximum when MU is zero
6	–2	24	TU falls when MU is negative
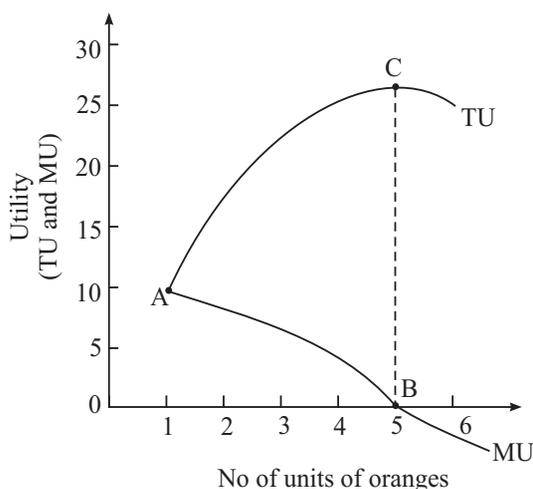
Fig. 14.1

1. MU is the rate of change of TU. It means that Total Utility increases as long as marginal utility is positive. In the table 14.1 marginal utility is declining between the range AB but is positive. So total utility is increasing at decreasing rate.

2. Total Utility is maximum when marginal utility is zero. At point B, MU = 0, and the corresponding point on TU is C where TU is maximum.

3. Total utility starts declining when marginal utility becomes negative (i.e., less than zero)

14.4 LAW OF DIMINISHING MARGINAL UTILITY

It is a matter of common observation that as we get more and more units of a commodity, the intensity of our desire for that commodity tends to diminish. The law of diminishing marginal utility also explains the same thing. It states that **'as more and more units of a commodity are consumed, marginal utility derived from each successive unit goes on diminishing.'**

The law can be explained with the help of an example. Suppose, a thirsty man drinks water. The first glass of water he drinks will give him maximum satisfaction (utility), say, 20 utils. Second glass of water will also fetch him utility but not as much as the first one because a part of his thirst is satisfied by drinking the first glass of water. Suppose he gets 10 utils from the second glass. It is just possible that he may get zero utility from the third glass because his thirst has now been satisfied. There will be negative utility from the fourth glass of water. Any rational consumer will not consume additional glass of water when it gives disutility or negative utility.

14.4.1 Assumption of Law of Diminishing Marginal Utility

The law of diminishing marginal utility operates under certain specific conditions. These are called assumptions of the law. Some important assumptions of the law are:.

1. It is assumed that utility can be measured and a consumer can express his satisfaction in quantitative terms like 1, 2, 3 etc. We have already said that unit of measurement of utility is 'util'. So utility is cardinal.

2. Quality of the commodity should not undergo any change. Take the above example of glass of water. From the quality point of view a consumer who drinks a glass of cold water must continue with the same. He or she cannot change its quality from cold to normal as normal water give different satisfaction.

3. Consumption should not proceed at intervals. It should be a continuous process. Continuing with the above example, second glass of water, if consumed two hours after the first glass of water was consumed, may give more, less or equal satisfaction.

4. Consumer should be a rational person. This means that he/she prefers more quantity to less quantity of a good.

5. Time period of consumption should not be too long. Consumer's tastes, habits, income etc. may change if the time gap is more.

6. The price of the substitute and complementary goods should not change. If these prices change, it may be difficult to predict about the utility derived from the commodity in question.

Notes

14.4.2 Exceptions to the Law of Diminishing Marginal Utility

Some of the important exceptions to the law are following:

(i)   A miser is not a good subject for this law. His desire for more wealth may in fact increase with every successive increase in the accumulation of wealth.

(ii) A collector of rare articles like stamps, coins, paintings etc. may escape this law.

(iii) The law may not apply when it comes to a melody recital or a beautiful scenic view.

These are in fact the only real exceptions of the law and these too do not prove real hurdles to the application of the law. It is easy to visualize that a miser or stamp collector or a musician may find their marginal utilities increasing instead of decreasing as postulated by the law. But this tendency shall not last for long having reached a particular stage; the law must come into operation.

INTEXT QUESTIONS 14.1

1. What is meant by consumer's equilibrium?
2. Define the following:
    (i)   Utility   (ii)   Marginal Utility   (iii)   Total Utility
3. State the law of diminishing marginal utility.
4. What will be the total utility when marginal utility is zero?

14.5 CONSUMER'S EQUILIBRIUM IN CASE OF A SINGLE COMMODITY

Consumer's equilibrium in case of a single commodity can be explained on the basis of the law of diminishing marginal utility. How does a consumer decide as to how much to buy of a good? It will depend upon two factors.

(a) The price she pays for each unit which is given and

(b) The utility she gets

At the time of purchasing a unit of a commodity, a consumer compares the price of the given commodity with its utility. The consumer will be at equilibrium when marginal utility (in terms of money) equals the price paid for the commodity say 'X' i.e. $MUx = P_X$. (Note that marginal utility in terms of money is obtained by dividing marginal utility in utils by marginal utility of one rupee).

If $MU_X > P_X$, the consumer goes on buying the commodity because she is paying less for each additional amount of satisfaction. As she buys more, MU falls due to operation of law of diminishing marginal utility. When MU becomes equal to price, consumer gets maximum satisfaction and now she is at equilibrium. When MU_X

Notes

$< P_x$, the consumer will have to reduce consumption of the commodity to raise his total satisfaction till MU becomes equal to price. This is because she is paying more than the additional amount of satisfaction that she is getting.

Consumer's equilibrium (in case of single commodity) can be explained with the help of table 14.2. Suppose, the consumer wants to buy a good which is priced at ₹.10 per unit. Further, suppose, MU obtained from each successive unit is determined. Assumed that 1 util = Re. 1.

Table 14.2: Consumer's Equilibrium (in case of a single commodity)

Consumption (Units of X)	Price (₹) (P_X)	MU_X (Utils)	MU_X(₹) (1 Util = Re. 1)	Difference	Remarks
1	10	20	20/1 = 20	10	$MU_x > P_x$, consumer will
2	10	16	16/1 = 16	6	increase the consumption
3	10	10	10/1 = 10	0	$MU_x = P_x$, consumer's equilibrium
4	10	4	4/1 = 4	–6	$MU_x < P_x$, consumer will
5	10	0	0/1 = 0	–10	decrease the consumption
6	10	–2	–2/1 = –2	–12	

It is clear from the table 14.2 that the consumer will be at equilibrium when he buys 3 units of the commodity X. He will increase consumption beyond 2 units as MUx $> P_x$. He will not consume 4 units or more of the commodity X as $MU_x < P_x$.

14.6 CONSUMER'S EQUILIBRIUM IN CASE OF TWO OR MORE COMMODITIES

The law of diminishing marginal utility applies in case of one commodity only. But in real life a consumer normally consumes more than one commodity. In such a situation, law of equi-marginal utility helps in optimum allocation of his income. Law of equi-marginal utility is based on law of diminishing marginal utility. According to the law of equi-marginal utility a consumer will be in equilibrium when the ratio of marginal utility of a commodity to its price equals the ratio of marginal utility of other commodity to its price.

Let a consumer buys two goods X and Y. Then at equilibrium

Notes

$MU_X/P_X = MU_Y/P_Y =$ MU of last rupee spent on each good, or simply MU of Money.

$$\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y} = \frac{MU_Z}{P_Z} = MU_{Money} - MU_{Money}$$

Similarly if there are three goods X, Y, Z then the condition of equilibrium will be simply MU Money.

Thus, to be in equilibrium

1. Marginal utility of the last rupee of expenditure on each good is the same.

2. Marginal utility of a good falls as more of it is consumed.

To explain the consumer's equilibrium in case of two goods let us take an example. Suppose a consumer has ₹ 24 with him to spend on two goods X and Y. Further, suppose price of each unit of X is ₹ 2 and that of Y is ₹ 3 and his marginal utility schedule is given in table 14.3.

Table 14.3: Consumer's Equilibrium (in case of two goods)

Units	MU_X	MU_X/P_x (A Rupee worth) of MU	MU_Y	MU_Y/P_Y (A Rupee worth) of MU
1	20	20/2 = 10	24	24/3 = 8
2	18	18/2=9	21	21/3=7
3	16	16/2 = 8	18	18/3=6
4	14	14/2 = 7	15	15/3 = 5
5	12	12/2 = 6	12	12/3 = 4
6	10	10/2=5	9	9/3=3

For obtaining maximum satisfaction from spending his income of ₹ 24, the consumer will buy 6 units of X by spending ₹ 12 (₹ 12 = 2 × 6) and 4 units of Y by spending ₹ 12 (₹ 12 = 2 × 6). This combination of goods brings him maximum satisfaction (or state of equilibrium) because a rupee worth of MU in case of good X is 5 ($MU_x/P_x = 10/2$) and in case of good Y is also 5

$$(MU_Y/P_Y = 15/3)$$

(= MU of last rupee spent on each good)

It should be noted that, consumer's maximum satisfaction is subject to-budget constraints i.e. the amount of money to be spent by the consumer (₹ 24 in this example)

What happens when the consumer is not in equilibrium?

Suppose, MUx/Px is greater than MUy/Py. This means that MU from last rupee spent on X is greater than the MU of the last rupee spent on Y. This induces the consumer to transfer his expenditure from Y to X. As a consequence, MUx falls and MU rises. The act of transfer of expenditure continues until MUx/Px becomes equal to MUy/Py.

14.7 LIMITATION OF UTILITY ANALYSIS

In the utility analysis, it is assumed that utility is cardinally measurable, i.e., it can be expressed in quantitative term. However, utility is a feeling of mind and there cannot be a standard measure of what a person feels. So, utility cannot be expressed in figures.

INTEXT QUESTIONS 14.2

1. State the necessary condition for consumer's equilibrium in case of a single good.

2. What are necessary conditions for consumer's equilibrium in case of two goods?

14.8   ORDINAL UTILITY APPROACH (INDIFFERENCE CURVE ANALYSIS)

You have already studied the utility approach which was based on the assumption that utility is measurable numerically (like 1 util, 2 utils, 3 utils). This is called cardinal utility approach. **Prof. J.R.** Hicks criticized the utility approach as unrealistic because satisfaction (utility) is a subjective phenomenon and so it can never be measured precisely. He, therefore, presented an alternative technique known as indifference curve approach (also called ordinal utility approach). It is based on the assumption that every consumer has a scale of preference in the form of assigning ranks (like 1st 2nd, 3rd rank) to different combinations of two goods called bundle and can tell which bundle he likes most.

Before we proceed to discuss the consumer's equilibrium through indifference curve approach, let us understand some useful concepts related to indifference curve analysis.

(i) Meaning of Indifference Curve

When a consumer consumes various goods and services, then there are some combinations (bundles) which give him same satisfaction. The graphical representation of such combinations is termed as indifference curve.

An indifference curve is a curve that shows all those combinations (bundles) of two goods which give equal satisfaction to the consumer.

Table 14.4 shows an indifference schedule showing all the combinations of good X and good Y giving 'equal satisfaction to the consumer.

Table 14.4: Indifference Schedule

Combinations	Good X (Units)	Good Y (Units)	Marginal Rate of Substitution ($\Delta Y/\Delta X$)
A	1	8	–
B	2	4	4Y: 1X
C	3	2	2Y: 1X
D	4	1	1Y : 1X

Combinations A, B, C and D of good X and Y viz. (1X + 8Y), (2X + 4Y), (3X + 2Y) and (4X + 1Y) give the consumer equal satisfaction. In other words, consumer is indifferent between these combinations of good X and good Y. When these combinations are represented graphically, we get an indifference curve as shown in Fig. 14.2.
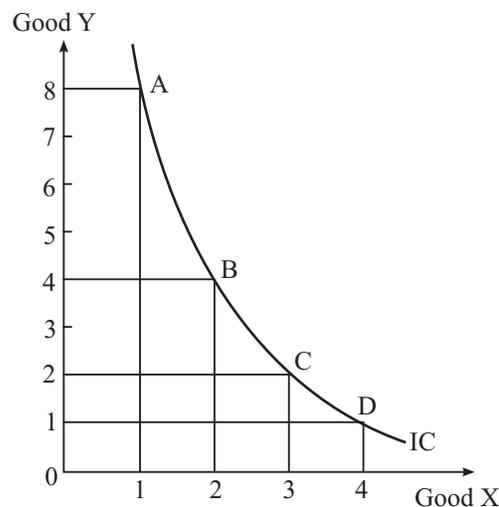
Fig. 14.2

(ii) Monotonic Preferences

Consumer's preferences are called monotonic if and only if between two bundles, consumer prefers the bundle which has more of at least one of the good and no less of other good as compared to other bundles. For example, between the bundles

(2X + 2Y), (1X + 2Y), (2X + 1Y) and (1X + 1Y), the consumer will prefer only bundle (2X + 2Y) to all the three bundles, if his preferences are monotonic.

(iii) Indifference Map

An indifference map is a collection of indifference curves that represent different levels of satisfaction. Higher indifference curves represent higher level of satisfaction because higher indifference curves represent more quantities of both the goods or same quantity of one good and more quantity of other good.
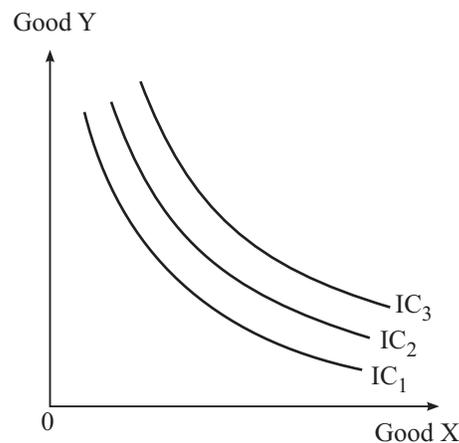
Fig. 14.3 Indifference Map

An indifference map containing three indifference curves IC_1, IC_2 and IC_3, is drawn in Fig. 14.3. All the bundles on IC_2 give more satisfaction to the consumer in comparison to IC_1. Similarly, the bundles on IC_3 give more satisfaction to the consumer in comparison to IC_1 and IC_2. This is a result of monotonic preferences.

(iv) Budget Line

A budget line graphically represents all possible combinations of two goods which a **consumer can buy with his entire income at the prevailing market prices.** Anywhere on the budget line consumer is spending his entire income either on single or both the goods. Suppose, the consumer wants to buy good X and good Y; price of each unit of X is P and that of Y is P_2; Then

Accordingly the expenditure on X will be equal to P_1X and the same on Y will be equal to P_2Y.

Total expenditure on good X and Y will be $P_1X + P_2Y$. Let the money required to buy these goods is denoted as M. So we can write that

$$P_1X + P_2Y = M$$

Notes

This is called the equation for budget line.

This is shown in Fig. 14.4
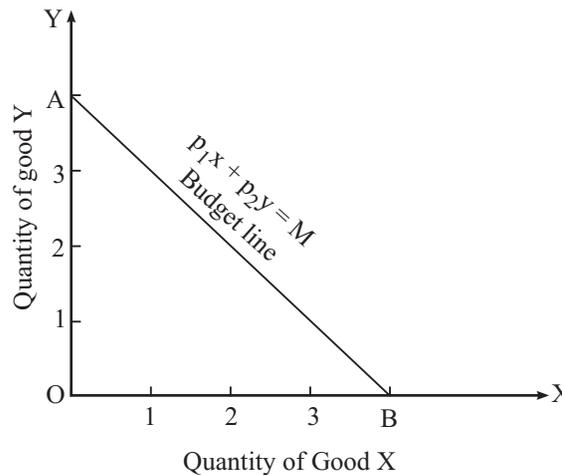
Fig. 14.4

In the Fig. 14.4, AB is the budget line. Point A is located by dividing the entire income over quantity of good Y only. Similarly point B is located by dividing the entire income over quantity of good X only. At any point on the line AB other than, A and B, the consumer can buy certain combination of X and Y by using her income.

A budget line changes when either the prices of the goods or income of the consumer or both changes. A budget line is negatively sloped because to buy more units of a good, consumer must buy less units of other good as consumer's income is fixed.

Slope of budget line = Quantity of other good sacrificed/ Quantity of good obtained = $\Delta Y/\Delta X$

Suppose, price of good X is ₹.2 and that of good Y is Re.1. So, he has to sacrifice 2 units of good Y to obtain one unit of good X. In this example,

Slope of budget line = $\Delta Y/\Delta X$

$$= 2/1$$

2/1 is nothing but the price ratio between good X and good Y. So the price ratio indicates the slope of budget line. Thus,

Slope of budget line = Px/Py. This is also called market rate of exchange (MRE) because the two goods can be exchanged at this rate, given their prices in the market.

Notes

(v) Budget Set

Budget set is the set of all possible combinations of two goods which a consumer can afford, given his income and market prices of the two goods. So, a budget set includes all the bundles of two goods which consumer can afford even if her entire income is not spent.

(vi) Marginal rate of substitution (MRS)

Marginal rate of substitution refers to the rate at which consumer is willing to give up amount of other good to obtain one extra unit of the good in question without affecting total satisfaction. So, the rate of substitution of one commodity for another is called marginal rate of substitution. It is expressed as MRSxy of good X for good Y. Symbolically, MRSxy = Loss of good Y/ Gain of good X = $\Delta Y/ \Delta X$

MRS_{xy} can be explained with the help of Fig. 14.5.
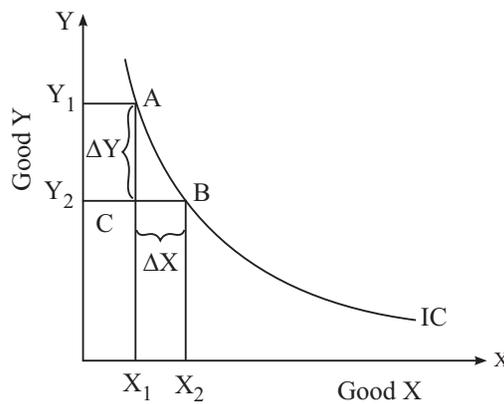
Fig. 14.5

$MRS_{XY} = \Delta Y/\Delta X = AC/CB$

AC/CB is the slope off indifference curve, i.e. slope of indifference curve = MRS_{XY}. As the consumer gets more and more units of good X, marginal utility of good X goes on falling with every increase in units of good X. Simultaneously, the consumer is left with lesser units of good Y. So, marginal utility of Y rises. Therefore, he is willing to give up lesser quantity of good Y for obtaining additional units of good X. Hence MRS diminishes along an indifference curve when we move from upwards to downward.

14.9 PROPERTIES OF INDIFFERENCE CURVES

(i) Indifference Curves are always convex to the origin

Indifference curves are always convex to the origin because of diminishing marginal rate of substitution. As the consumer consumes more and more of one

good, his marginal utility of this good keeps on declining and he is willing to give up less of other good. Therefore, indifference curves are convex to the origin.

(ii) Indifference Curves slope downwards

It implies that as a consumer consumes more of one good, he must consume less quantity of the other good so that the total utility remains the same.

(iii) Higher Indifference Curves represent Higher level of satisfaction

Consider Fig. 14.6
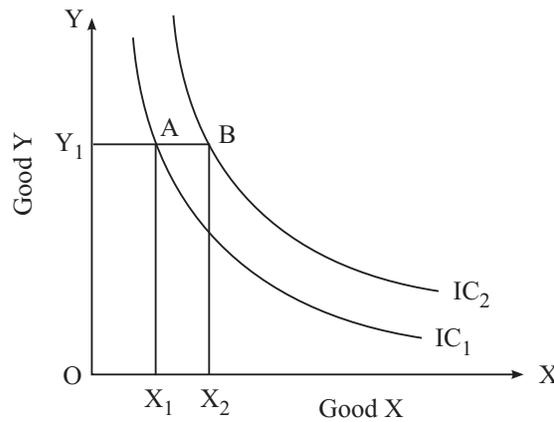
Fig. 14.6

Bundle A on indifference curve IC_1, contains OY_1 quantity of good Y and OX, quantity of good X. Bundle B on indifference curve IC_2 has same quantity i.e. OY_1 of good Y but more quantity i.e. OX_2 of good X. Since, the consumer's preferences are monotonic, he will prefer bundle B to bundle A. It means, higher indifference curves represent higher level of satisfaction.

(iv) Indifference Curves can never Intersect

To analyze this, let us consider Fig. 14.7
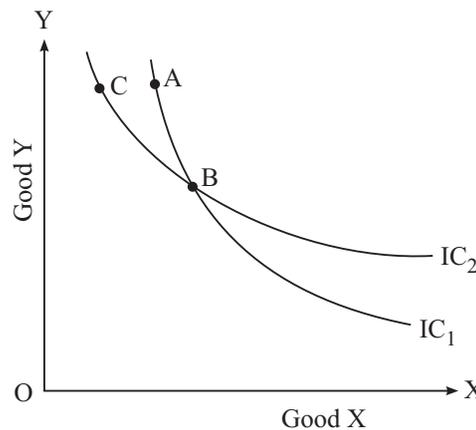
Fig. 14.7

We have two indifference curves that intersect at point B. The consumer is indifferent between bundles A and B as they lie on the same indifference curve IC_1. Similarly, the consumer is indifferent between bundles C and B as they lie on the same indifference curve IC_2. This implies that bundles A and C give the consumer the same level of satisfaction. However, this is not possible as higher indifference curve represents higher level of satisfaction.

14.10 ASSUMPTIONS OF INDIFFERENCE CURVES

Indifference curve analysis is based upon the following assumptions:

(i) It is assumed that the consumer has fixed amount of money whole of which is to be spent on two goods, given the market prices of goods.

(ii) It is assumed that the consumer has not reached the point of satiety. He always prefers more of both the commodities.

(iii) Consumer can rank his preferences on the basis of the satisfaction from each bundle of goods.

(iv) It is assumed that marginal rate of substitution is diminishing.

(v) Consumer is a rational person i.e. he always aims to maximize his satisfaction.

14.11 CONSUMER'S EQUILIBRIUM BY INDIFFERENCE CURVE ANALYSIS

As stated earlier, consumer's equilibrium refers to a situation when he gets maximum satisfaction and he feels no need to change his position, subject to his income and market prices of two goods.

Condition of Consumer's Equilibrium

According to indifference curve approach, a consumer will be at equilibrium when:

(i) Budget line is tangent to the indifference curve.

   i.e. slope of budget line = slope of indifference curve

   Or, $MRS_{XY} = P_x/P_Y$

Suppose, two goods consumed are X and Y. Further suppose the consumer wants to increase consumption of good X in place of good Y. MRS is the rate/at which consumer is willing to sacrifice amount of Y to get one more unit of X. Market rate of exchange (MRE) is the rate at which consumer has to sacrifice amount of Y to get one more unit of X.

Notes

When MRS>MRE, it implies that in order to obtain one unit of X, the consumer is willing to sacrifice more units of Y than the market allows. This will lead to increase in consumption of X but decrease in consumption of Y. MRS starts falling. He continues to consume more of X till MRS becomes equal to MRE.

When MRS<MRE, it implies that inorder to get one more unit of X, the consumer is willing to sacrifice less units of Y than the market requires. He will reduce the consumption of X and increase consumption of Y. MRS Starts rising. He continues reducing consumption of X till MRS becomes equal to MRE.

To study consumer's equilibrium, let us study the Fig. 14.8
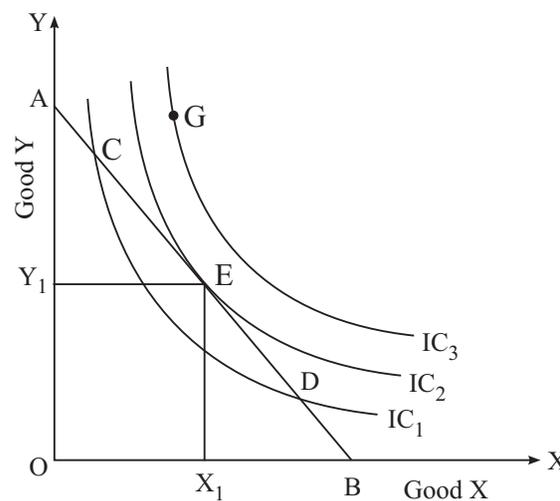
Fig. 14.8

Given the indifference map and the budget line, the consumer is at equilibrium at point E. The consumer obtains maximum satisfaction when, he consumes bundle E containing OX_1 quantity of good X and OY_1 quantity of good Y. At E point budget line is tangent to the indifference curve IC_2, i.e. MRS = MRE = Px/PY Note that the consumer can buy bundles C and D because they also lie on his budget line but these bundles lie on lower indifference curve which represents lower level of satisfaction. He will like to consume bundle G lying on indifference curve IC_3 which represents highest level of satisfaction but it is beyond his budget. So the consumer's equilibrium bundle is X_1, Y_1 at point E where the budget line is tangent to indifference curve.

INTEXT QUESTIONS 14.3

1. What is an indifference curve?

2. Define marginal rate of substitution.

3. What do you mean by monotonic preferences? Give example.

4. State the conditions of consumer's equilibrium in indifference curve approach.

Notes

WHAT YOU HAVE LEARNT

- Consumer's equilibrium refers to a situation when he/she spends his/her money income on purchase of a commodity/bundle in such a way that yields him/her maximum satisfaction and he/she feels no urge to change.

- Utility is the power of a commodity to satisfy a want.

- Marginal utility is the addition to the total utility derived from the consumption of an additional unit of a commodity, say good X.

$$MU_X = \frac{\Delta TU}{\Delta X}$$

- Total utility (TU) is the total satisfaction obtained from the consumption of all possible units of a commodity.

$TU_n = MU_1 + MU_2 + MU_3 + ... MU_n$

- (i) TU increases when MU is positive

  (ii) TU is maximum when MU is zero

  (iii) TU falls when MU is negative

- Law of diminishing marginal utility states that 'as more and more units of a commodity are consumed, marginal utility derived from each successive unit goes on diminishing.'

- In case of a single commodity a consumer will be at equilibrium when marginal utility (in terms of money) equals the price paid for the commodity.

  i.e., $MU_X = P_X$, where X is the commodity.

- In case of two goods, a consumer will be in equilibrium when (i) the ratio of MU of a good to its price equals the ratio of MU of another good to its price, i.e. $MU_X/P_X = MU_Y/P_Y = $ MU of last rupee spent on each good. This is called law of equimarginal utility.

- An indifference curve is a curve that shows all those combinations of two goods which give equal satisfaction to the consumer

Notes

- An indifference map is a collection of indifference curves that represent different levels of satisfaction.-

- A budget line graphically represents all possible combinations of two goods which a consumer can buy with his entire income at the prevailing market prices.

- Budget set is the set of all possible combinations of two goods which a consumer can afford, given his income and market prices of the two goods.

- Marginal rate of substitution refers to the rate at which consumer is willing to give up amount of other good to obtain one extra unit of the good in question without affecting total satisfaction.

- Consumer's preferences are called monotonic if and only if between two bundles, consumer prefers the bundle which has more of at least one of the good and no less of the other good as compared to the other bundles.

- Properties of indifference curves are:

    (i)   Indifference curves are always convex to the origin;

   (ii)   Indifference curves always slope downwards;

  (iii)   Indifference curves never intersect;

  (iv)   Higher Indifference curves represent higher level of satisfaction.

- According to indifference curve approach a consumer will be in equilibrium when,

    (i)   Budget line is tangent to the indifference curve

          or $MRS = P_X/P_Y$

          or $MRS = MIRE$

TERMINAL EXERCISE

1. What is meant by consumer's equilibrium? Explain the condition of consumer's equilibrium in case of a single commodity using utility approach.

2. Explain the condition determining how many units of a good the consumer will buy at a given price.

3. Explain the relationship between total utility and marginal utility.

4. Explain the law of diminishing marginal utility with the help of a schedule.

5. A consumer buys two goods X and Y. Explain the conditions of his equilibrium using utility approach.

6. A consumer buys two goods X and Y. Explain the conditions of his equilibrium using indifference curve approach.

7. Explain the properties of indifference curves.

ANSWERS TO INTEXT QUESTIONS

14.1

1. Read section 14.1

2. (i) Read section 14.2(i)

   (ii) Read section 14.2(ii)

   (iii) Read section 14.2(iii)

3. Read section 14.3 (Maximum)

14.2

1. Read section 14.5

2. Read section 14.6

14.3

1. Read section 14.8(i)

2. Read section 14.8(vi)

3. Read section 14.8(ii)

4. Read section 14.11

Notes

15

DEMAND

You have already studied in the previous lessons that goods and services have the power to satisfy our wants. We have unlimited wants. Most of them can be satisfied by goods and services. Therefore, we purchase goods and services from the market. Now a days the market is flooded with various types of goods. We cannot purchase all these goods since we have limited money. So, we have to make a choice between what to purchase and what not to purchase. We decide to purchase a good or a combination of goods depending on the amount of money we have and the price we have to pay. All these things are related with the study of **Demand**.

OBJECTIVES

After completing this lesson, you will be able to:

- explain the meaning of demand;
- differentiate between desire, want and demand;
- differentiate between individual demand and market demand;
- explain the factors that affect individual demand and market demand for a commodity;
- explain the Law of Demand;
- identify the reasons of law of demand as well as exception to law of deamand;
- prepare a hypothetical individual demand schedule and draw an individual demand curve;
- prepare a market demand schedule and draw a market demand curve; and
- Differentiate between movement along the demand curve and shift in the demand curve.

15.1 MEANING OF DEMAND

It is commonly observed that people alternatively use the terms desire, want and demand. In economics, they are not same. Desire means merely a wish to have a commodity. It is simply craving for a commodity. So any body can desire anything, irrespective of whether that thing is really available or not. On the otherhand, want is the desire which is backed by ability and willingness to pay. So every desire is not a want. Desire becomes a want only when the person is in a position to satisfy it.

By demand for a commodity we **mean** the desire for the commodity backed by purchasing power and the willingness to spend. When a consumer wishes to consume a commodity and has also the necessary purchasing power i.e. income along with willingness to spend, he is said to have demand for the commodity.

Demand for a commodity refers to the quantity of a commodity that a consumer is willing to buy at a given price during a given period of time.

The definition of demand highlights three essential elements of demand:

(i)   price of the commodity

(ii)   quantity of the commodity

(iii) period of time: the time period may be a day, a week, a month, a year or any other period.

Let us consider the following statements:

(i)   Mr. Akshay purchased 2kgs. apples last week.

(ii)   Mr. Akshay purchased 2Kgs. apples when the price of apples was ₹ 60 per kg.

(iii) Mr. Akshay purchased 2Kgs. apples last week when the price of apples   was ₹ 60 per Kg.

The first two statements are incomplete in context of demand. In the first statement the price of apples is not stated. In the second statement period of time is not stated. The third statement is complete as it states the quantity of the apples, the price of apples and the time period during which the said quantity is demanded.

15.2 INDIVIDUAL DEMAND AND MARKET DEMAND

Individual demand for a commodity refers to the quantity of the commodity that an individual buyer is willing to buy at a given price during a given period of time. In the example given in the beginning of the lesson Akshay's demand for apple is the individual demand for apple.

But Akshay is not the only buyer of apple in the market. There may be other persons who may demand apples in the market. Let us assume that besides Akshay there are three more buyers of apples in the market Rohit, Ritik and Ajai. Market demand for apples will be the sum of demand of all the buyers of apples at a given price during a given period of time. Suppose, when price of apples is ₹ 60 per Kg., Akshay buys 2 Kgs., Rohit buys 3 Kgs., Ritik buys 2.5 Kgs. and Ajai buys 1.5 Kgs. of apples during a week then market demand for apples will be 2 + 3 + 2.5 + 1.5 = 9 kgs. at price ₹ 60 per kg.

Thus, **market demand** for a good means the total quantity of a commodity that all the buyers of the good are willing to buy at a given price over a given time period.

INTEXT QUESTIONS 15.1

1. What is meant by demand for a commodity?

2. What are the three essential elements of demand?

3. How does a desire differ from demand?

4. Distinguish between individual demand and market demand?

15.3 FACTORS AFFECTING INDIVIDUAL DEMAND FOR A COMMODITY

The factors that influence a consumer's decision to purchase a commodity are also known as determinants of demand. The following factors affect the individual demand for a commodity:

1. price of the commodity

2. price of related goods

3. income of buyer of the commodity

4. tastes and preferences of the buyer

1. Price of the Commodity

You must have observed that when price of a commodity falls, you tend to buy more of it and when its price rises, you tend to buy less of it, when all other factors remain constant ('other things remaining the same'). In other words, **other things remaining the same, there is an inverse relationship between the price of a commodity and its quantity demanded by its buyers.** This statement is in accordance with law of demand which you will study in the later part of this lesson.

Price of a commodity and its quantity demanded by its buyers are inversely related only when 'other things remain the same'. So, 'other things remaining the same' is an assumption when we study the effect of changes in the price of a commodity on its quantity demanded.

Notes

2. Price of Related goods

A consumer may demand a particular good. But while buying that good he/she also asks the price of its related goods.

Related goods can be of two types-

(i) Substitute goods

(ii) Complementary goods

While purchasing a good, prices of its substitutes and complements do affect its quantity purchased.

(i) **Price of Substitute Goods: Substitute goods are those goods which can easily be used in place of one another for satisfaction of a particular want,** like tea and coffee. An increase in price of substitute good leads to an increase in demand for the given commodity and a decrease in price of substitute good leads to a decrease in demand for the given commodity. It means demand for a given commodity is directly affected by change in price of substitute goods. For example, if price of coffee increases, the demand for tea will rise as tea will become relatively cheaper in comparison to coffee.

(ii) **Price of Complementary goods: Complementary goods are those goods which are used together to satisfy a particular want** like car and petrol**.** An increase in the price of complementary goods leads to a decrease in demand for the given commodity and a decrease in the price of complementary goods leads to an increase in demand for the given commodity. For example, if price of petrol falls then the demand for cars will increase as it will be relatively cheaper to use both the goods together. So, demand for a given commodity is inversely affected by change in price of complementary goods.

3. Income of the Buyer of Commodity

Demand for a commodity is also affected by income of its buyer. However, the effect of change in income on demand depends on the nature of the commodity under consideration.

In case of some goods like full cream milk, fine quality of rice (Basmati rice) etc, demand for these commodities increases when income of the buyer increases and demand for these commodities decreases when income of the buyer decreases. Such goods, whose demand increases with the increase in income of the buyer, are called **normal goods.** But there are some goods like coarse rice, toned milk etc.

Notes

whose demand decreases when income of buyer increases and their demand increases when income of the buyer decreases. Such goods, whose demand decreases with the increase in income of the buyer, are called **inferior goods**. Suppose, a consumer buys 10 Kgs. of rice whose price is ₹ 25 per Kg. He cannot afford to buy better quality of rice because the price of such rice is ₹ 50 per Kg. The consumer is spending ₹ 250 per month on the purchase of rice. Now, if income of the consumer increases and he can afford ₹ 350 on purchase of 10 Kg. of rice. Now he can afford to buy some quantity of rice, say 6 Kgs., whose price is ₹ 25 per Kg. and may buy 4 Kgs. of rice whose price is ₹ 50 per Kg. Thus he will buy 10 Kgs. of rice by spending ₹ 350 per month.

Therefore, we may conclude that demand for normal goods is directly related to the income of the buyer but demand for inferior goods is inversely related to the income of the buyer.

4.   Tastes and Preferences of the Buyer

The demand for a commodity is also affected by the tastes and preferences of the buyers. They include change in fashion, customs, habits etc. Those commodities are preferred by the consumers which are in fashion. So, demand for those commodities rises which are in fashion. On the other hand, if a commodity goes out of the fashion, its demand falls because no consumer will like to buy it.

15.4   FACTORS AFFECTING MARKET DEMAND FOR A COMMODITY

As stated earlier market demand is the total quantity of a commodity that all its buyers taken together are willing to buy at a given price during a given period of time. In addition to the factors affecting individual demand for a commodity, market demand is also influenced by the following factors:

(i) Number of Buyers in the Market(Population)

Increase in population raises the market demand, whereas decrease in population reduces the market demand for a commodity. Not only the size of population but its composition like age (ratio of males, females, children and old people in population) also affects the demand for a commodity. It is because of needs of children, young, old, male and female population differ.

(ii) Distribution of Income and Wealth

If the distribution of income and wealth is more in favour of the rich, demand for the commodities preferred by the rich such as comforts and luxuries is likely to be higher. On the other hand, if the distribution of income and wealth is more in favour of poor, demand for commodities preferred by the poor such as necessities will be more.

(iii) Season and Weather Conditions

This is generally observed that the demand for woolens increases during winter whereas, demand for ice creams and cold drinks increases during summer. Similarly, market demand for umbrellas, rain coats increases during rainy season.

Notes

INTEXT QUESTIONS 15.2

1. What are substitute goods? Give one example of substitute goods.

2. What are inferior goods? Give one example of inferior goods.

3. What are normal goods? Give one example of normal goods.

15.5 LAW OF DEMAND

We have already studied about the effect of change in price on demand for a commodity. The law of demand explains the relationship of price of a commodity and its quantity demanded, when all other factors affecting demand remain constant.

The law of demand states that **other things remaining same, quantity demanded of a commodity is inversely related to its price.** In other words, demand for a commodity rises when its price falls and its demand falls when price rises provided other factors remain unchanged.

The law of demand can better be explained with the help of table 15.1 and figure 15.1

Table 15.1

Price (In ₹)	Quantity Demanded (In Units)
1	10
2	8
3	6
4	4
5	2

Fig. 15.1

As you see in table 15.1 when price of the commodity rises, quantity demanded decreases.
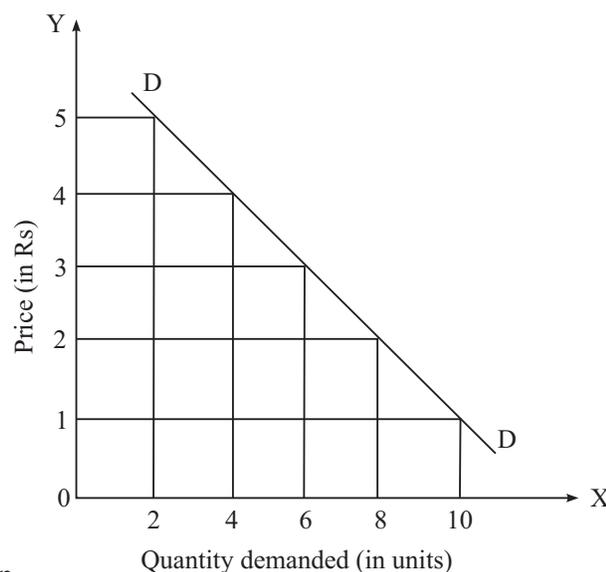
Notes

That is why the demand curve slopes downwards from left to right as shown in Fig. 15.1. Downward slope of demand curve shows the inverse relationship of price and quantity demanded of a commodity.

15.6 ASSUMPTIONS OF LAW OF DEMAND

In law of demand all other factors except price of the commodity are assumed to be constant. Therefore, we use the phrase 'other things remaining same'. This phrase is used to cover the following assumptions on which the law is based:

1. Prices of substitute goods do not change.

2. Prices of complementary goods do not change.

3. Income of the buyer remains the same.

4. There is no change in tastes and preferences of the buyer.

15.7 REASONS FOR OPERATION OF LAW OF DEMAND

Now we will try to explain why does a consumer purchase more quantity of a commodity at a lower price and less of it at a higher price or why does the law of demand operate i.e. why does the demand curve slope downwards from left to right. The main reasons for operation of law of demand are:

1. Law of Diminishing Marginal Utility

As you have studied earlier, law of diminishing marginal utility states that as we consume more and more units of a commodity, the utility derived from each successive unit goes on decreasing. The consumer will be ready to pay more for those units which provide him more utility and less for those which provide him less utility. It implies that he will purchase more only when the price of the commodity falls.

2. Income Effect

When price of a commodity falls, purchasing power or real income of the consumer increases which enables him to purchase more quantity of the commodity with the same money income. Let us take an example. Suppose you buy 4 ice creams when price of each ice cream is ₹ 25. If price of ice creams falls to ₹ 20, then with same money income you can buy 5 ice creams now.

3. Substitution Effect

When price of a commodity falls, it becomes comparatively cheaper as compared to its substitutes (although price of substitutes has not been changed). This will lead to rise in demand for the given commodity. For example, if coke and Pepsi

both are sold at ₹ 10 each and price of coke falls. Now coke has become relatively cheaper and will be substituted for Pepsi. It will lead to rise in demand for coke.

4. Change in Number of Buyers

When price of a commodity falls, some old buyers may demand more of the commodity at the reduced price and some new buyers may also start buying this commodity who were not in a position to buy it earlier due to higher price. This will lead to increase in number of buyers when price of the commodity falls. As a result demand for the commodity rises when its price falls.

5. Diverse Uses of a Commodity

Some commodities have diverse uses, like milk. It can be used for drinking, for sweet preparation, for ice cream preparation etc. If price of milk rises, its use may be restricted to important purpose only. This will lead to reduction in demand for other less important uses. When price of milk falls, it can be put to other uses also leading to rise n demand for it.

15.8 EXCEPTIONS TO THE LAW OF DEMAND

You have studied in law of demand that a buyer is willing to buy more quantity of a commodity at a lower price and less of it at a higher price. But in certain circumstances, a rise in price may lead to rise in demand. These circumstances are called Exceptions to the Law of Demand. Some important exceptions are:

1. Giffen Goods

Giffen goods are special type of inferior goods in which negative income effect is stronger than negative substitution effect. Giffen goods do not follow law of demand as their demand rises when their price rises. Examples of Giffen goods are jowar and bajra etc.

2. Status Symbol Goods

Some goods are used by rich people as status symbols, e.g. diamonds, gold jewellary etc. The higher the price, the higher will be the demand for these goods. When price of such goods falls, these goods are no longer looked at as status symbol goods and, tehrefore, therir demand falls.

3. Necessities

Commodities such as medicines, salt, wheat etc. do not follow law of demand because we have to purchase them in minimum required quantity, whatever their price may be.

Notes

Notes

4. Goods Expected to be Scarce

When the buyers expect a scarcity of a particular good in near future, they start buying more and more of that good even if their prices are rising. For example, during war, famines etc. people tend to buy more of some goods even at higher prices due to fear of their scarcity in near future.

INTEXT QUESTIONS 15.3

1. State the law of demand.

2. State any two assumptions of law of demand.

3. State any two exceptions of law of demand.

15.9 INDIVIDUAL DEMAND SCHEDULE

In law of demand you have studied that other things remaining same, quantity demanded of a commodity is inversely related to its price. This inverse relationship of price and quantity demanded by an individual buyer can also be explained with the help of a schedule. **Individual demand schedule shows different quantities of a commodity demanded by an individual buyer at different prices. Such a schedule is given in table 15.2.**

Table 15.2 Individual Demand for Apples

Price of Apples Per kg. (₹)	Quantity Demanded of Apples (per week) (In kgs.)
90	1
80	2
70	3
60	4
50	5

The above schedule shows that when price of apples is ₹ 90 per Kg. quantity demanded is 1 Kg. per week. But when price falls to ₹ 80, ₹ 70, ₹ 60 and ₹ 50 per Kg. quantity demanded increases to 2 Kgs., 3 Kgs., 4 Kgs. and 5 Kgs. per week respectively. **So, the demand schedule is a tabular statement of law of demand. Demand schedule shows different quantities of a commodity demanded at different prices in tabular form.**

15.10 INDIVIDUAL DEMAND CURVE

Demand curve is a diagrammatic presentation of law of demand. If we plot the individual demand schedule on the graph paper, we will get a curve which is called as individual demand curve. Individual demand curve is shown in Fig. 15.2.
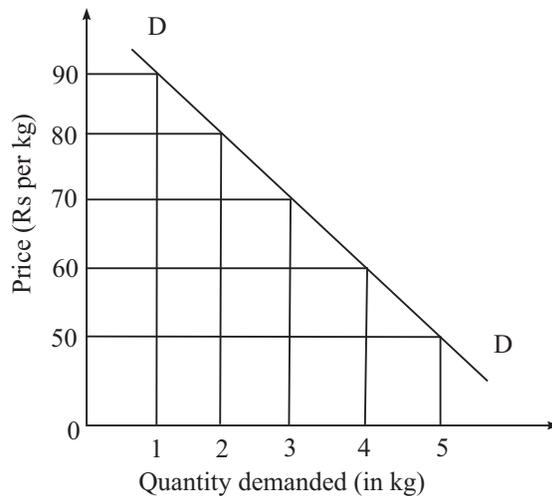
Fig. 15.2: Individual demand curve

As seen in the diagram, price is taken on Y-axis and quantity demanded on X-axis. Points A, B, C, E and F represent five combinations of price and quantity demanded of apples given in table 15.2. Point A shows that at the price of ₹ 90 per Kg. the quantity demanded of apples is 1 Kg. per week, Point B shows the quantity demanded is 2 Kgs. per week when the price is ₹ 80 per Kg. Similarly, the other combinations of price and quantities demanded of apples as given in table 15.2 are shown as points C, E and F. By joining these points individual demand curve for apples has been derived.

15.11 MARKET DEMAND SCHEDULE

As explained earlier, market demand is the total quantity of a commodity that all its buyers taken together are willing to buy at a given price during a given period of time. From the individual demand schedules of a commodity, we can prepare the market demand schedule of that commodity. We assume that there are only three buyers A, B and C of apples in the market. The demand schedules of these buyers are given in table 15.3.

Notes

Price of Apples	Quantity Demanded of Apples per week (In kgs.)			Market Demand of Apples per week (In kgs.)
	A	**B**	**C**	**M.D. = A + B + C**
90	1	3	2	1 + 3 + 2 = 6
80	2	5	3	2 + 5 + 3 = 10
70	3	7	4	3 + 7 + 4 = 14
60	4	9	5	4 + 9 + 5 = 18
50	5	11	6	5 + 11 + 6 = 22

When price of apples is ₹ 90 per Kg. A demands 1 Kg. of apples, B demands 3 Kgs. of apples and C demands 2 Kgs. of apples. Thus market demand for apples at a price of ₹ 90 per Kg. is 1 + 3 + 2 = 6 Kgs. per week. Likewise, market demand for apples can be obtained at other prices also as shown in table 15.3.

15.12 MARKET DEMAND CURVE

Just as we plotted the individual demand curve on a graph paper, if we now plot the market demand schedule given in table 15.3, we will get the following figure 15.3.
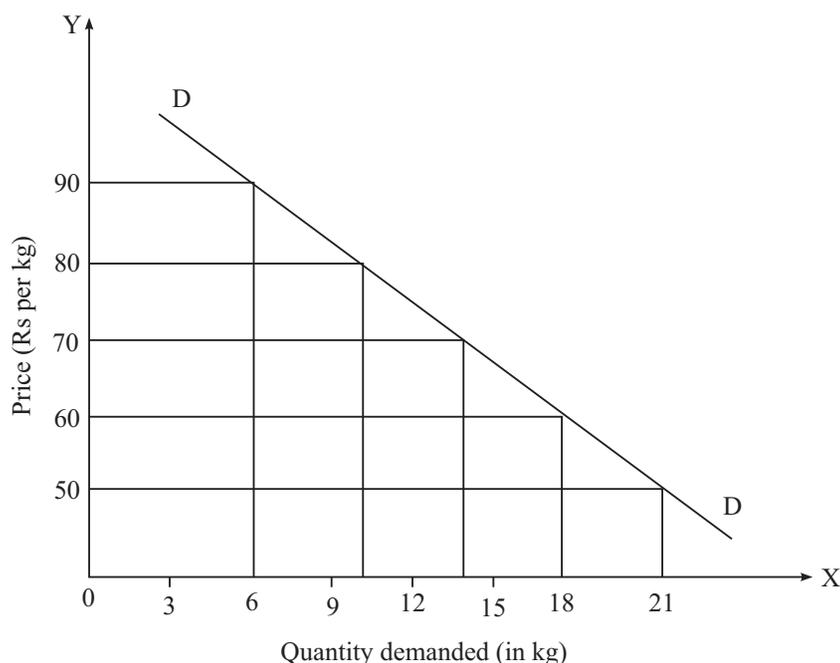
Fig. 15.3

In Figure 15.3 points F, G, H, I and J show the quantity demanded of apples per week in the market at each of the price given in schedule 15.3. Point F shows that the market demand per week of apples is 6 Kgs when the price of apples is ₹ 90 per Kg. Similarly, the other combinations of price and quantity demanded of apples as given in table 15.3 are shown as points G, H, I and J. By joining these points market demand curve for apples can be obtained. Thus, market demand curve is a horizontal summation of individual demand curves.

15.13 MOVEMENT ALONG THE DEMAND CURVE (CHANGE IN QUANTITY DEMANDED)

In law of demand you have already studied the inverse relationship between price and quantity demanded. When quantity demanded of a commodity changes due to change in its price, keeping other factors constant, it is called change in quantity demanded. It is graphically expressed as a **movement along the same demand curve**.

There can be either a downward movement or an upward movement along the same demand curve. Upward movement along the same demand curve is called **contraction of demand or decrease in quantity demanded** and downward movement along the same demand curve is known as **expansion of demand or increase in quantity demanded.** These can better be explained with the help of Fig. 15.4.
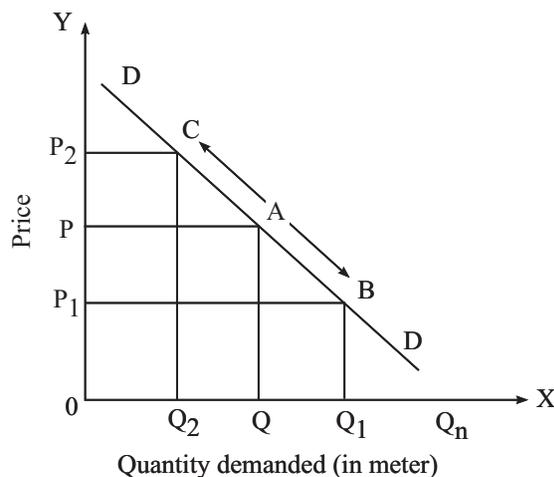
Fig. 15.4: Movement along the demand curve

A fall in price from OP to OP_1 leads to increase in quantity demanded from OQ to OQ_1 (expansion of demand) resulting in a downward movement from point A to point B along the same demand curve DD.

When Price rises from OP to OP$_2$, quantity demanded falls from OQ to OQ$_2$ (contraction of demand) leading to an upward movement from point A to point C along the same demand curve DD.

Expansion of demand and contraction of demand can also be explained through a demand schedule.

See the following demand schedules of apples in table 15.4 and 15.5:

Table 15.4 Expansion of Demand

Price of apples (₹ Per kg.)	Quantity Demanded of apples per week (In kg.)
70	3
60	4
50	5

As seen in table 15.4, as price of apples falls, quantity demanded of apples increases, showing expansion of demand. This is also called increase in quantity demanded.

Table 15.5 Contraction of Demand

Price of apples (₹ Per kg.)	Quantity Demanded of apples per week (In kg.)
70	3
80	2
90	1

You can see in table 15.5 when price of apples rises, quantity demanded falls showing contraction of demand. This is also called decrease in quantity demanded.

15.14 SHIFT IN DEMAND CURVE (CHANGE IN DEMAND)

In law of demand all factors other than price of the commodity are assumed to be constant. But what happens when other factors determining demand change but price remains constant? When the demand of a commodity changes at the same price, it means the change is due to change in anyone or more of the other factors that affect demand. **When the demand for a commodity changes due to change in any factor other than the price of the commodity, it is known as change n demand.** It is graphically expressed as **shift in demand curve.**

Demand curve of a commodity may shift due to change in price of substitute good, change in price of complementary goods, change in income of the buyer, change in tastes and preferences, change in population, change in distribution of income, change in season and weather etc.

The shift in demand curve can be explained with the help of Fig. 15.5:
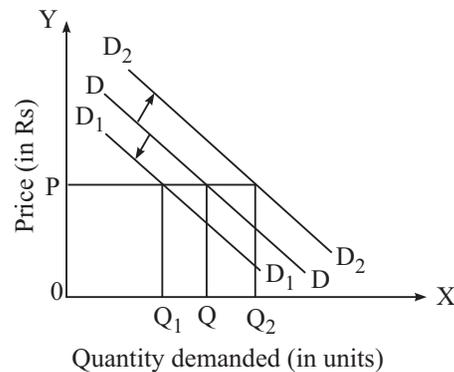
Fig. 15.5: Shift in demand curve

You can see in fig. 15.5 that quantity demanded decreases from OQ to OQ_1 at the same price OP. This decrease is due to unfavourable change in factors other than price of the commodity. This is called **decrease in demand.** When there is decrease in demand, the demand curve shifts towards left.

When quantity demanded increases from OQ to OQ_2 at same price OP, this is called **increase in demand.** Increase in demand is due to favourable change in factors other than price of the commodity. In case of increase in demand, the demand curve shifts towards right.

Increase in demand and decrease in demand can also be explained with the help of demand schedules. Table 15.6 explains increase in demand:

Table 15.6 Increase in Demand

Price of Apples (₹ Per Kg.) (1)	Quantity Demanded of Apples (In kgs.) (2)	Quantity Demanded of Apples (In kgs.) (3)
90	1	2
80	2	3
70	3	4

Notes

If you study table 15.6, you will find that at a price of ₹ 90per Kg. quantity demanded of apples rises from 1 Kg. to 2 Kg. Similarly at all other prices the quantity demanded of apples is more in column 3. This rise in demand is due to change in factors other than price of the commodity.

In the same way, we can prepare a demand schedule for decrease in demand. Table 15.7 explains decrease in demand:

Table 15.7 Decrease in Demand

Price of Apples (₹ Per kg.) (1)	Quantity Demanded of Apples (In kgs.) (2)	Quantity Demanded of Apples (In kgs.) (3)
70	3	2
60	4	3
50	5	4

Quantities of apples shown in column (3) of the table show the fall in demand at the same price. This fall in demand is due to unfavorable change in factors other than price of the commodity.

INTEXT QUESTIONS 15.4

1. What is a demand schedule?

2. Complete the following table:

Price (₹ Per Unit)	Quantity Household	Demanded Household	(Units) Household	Market Demand (Units)
	A	B	C	
1	15	20	16	–
2	12	18	13	–
3	9	16	10	–
4	6	14	7	–
5	3	12	4	–

3. What is meant by expansion of demand of a commodity?

4. State any two factors which may lead to increase in demand for a commodity?

WHAT YOU HAVE LEARNT

Notes

- Demand for a commodity is the quantity of a commodity that a consumer is willing to buy at a given price during a given period of time.

- Desire means a mere wish to have a commodity. Want is that desire which is backed by the ability and willingness to satisfy it. Demand is the want of a commodity at a given price during a given period of time.

- The main determinants of individual demand are: (i) Price of the commodity (ii) Price of related goods (iii) Income of the buyer and (iv) Tastes and preferences of the buyer.

- In addition to the factors affecting individual demand, market demand for a commodity is also affected by (i) Number of buyers in the market (ii) Distribution of income and wealth and (iii) Season and weather etc.

- The law of demand states that other things remaining same, quantity demanded of a commodity is inversely related to its price.

- The demand curve slopes downwards from left to right due to (i) Law of diminishing marginal utility (ii) Income effect (iii) Substitution effect (iv) Change in number of buyers and (v) Diverse uses of a commodity.

- Exceptions to the law of demand are: (i) Giffen goods (ii) Status symbol goods (iii) Necessities (iv) Goods expected to be scarce.

- Demand schedule is a tabular statement of different quantities of a commodity demanded at different prices.

- Individual demand schedule shows different quantities of a commodity demanded by an individual buyer and market demand schedule is an aggregate of all individual demand schedules in the market.

- Demand curve is a diagrammatic representation of law of demand.

- Individual demand curve shows different quantities of a commodity demanded by an individual buyer in a diagrammatic form. Market demand curve is a sum of horizontal slopes of all individual demand curves.

- When the quantity demanded of a commodity rises due to fall in price of a commodity, it is called expansion of demand or increase in quantity demanded.

- When the quantity demanded of a commodity falls due to rise in its price of a commodity, it is called contraction of demand or decrease in quantity demanded.

- In case of expansion of demand, there is a downward movement along the same demand curve and in case of contraction of demand, there is an upward movement along the same demand curve.

Notes

- When the quantity demanded of a commodity rises due to change in factors other than price of the commodity, it is called increase in demand.

- When the quantity demanded of a commodity falls due to change in factors other than price of the commodity, it is called decrease in demand.

- In case of increase in demand, the demand curve shifts towards right. In case of decrease in demand, the demand curve shifts towards left.

TERMINAL EXERCISE

1. What is meant by the term 'demand'?

2. Distinguish between 'desire', want and 'demand' with suitable example.

3. Explain the factors affecting individual demand for a commodity.

4. How is demand for a commodity affected by increase in income of its buyer?

5. Distinguish between (i) Substitute goods and complementary goods (ii) Normal goods and inferior goods

6. State and explain the law of demand.

7. What are the reasons of law of demand?

8. Explain any three conditions in which law of demand does not operate.

9. Distinguish between expansion of demand and increase in demand.

10. Distinguish between contraction of demand and decrease in demand.

ANSWERS TO INTEXT QUESTIONS

15.1

1. Read section 15.1

2. Read section 15.1

3. Read section 15.2

4. Read section 15.3

15.2

1. Read section 15.4

2. Read section 15.4

3. Read section 15.4

15.3

1. Read section 15.6

2. Read section 15.7

3. Read section 15.9

15.4

1. Read section 15.10

2. 51, 43, 35, 27, 19

3. Read section 15.14

4. Read section 15.15

Notes

Notes

16

PRICE ELASTICITY OF DEMAND

You learnt that the law of demand which explains the inverse relationship between price and quantity demanded of a commodity. The law of demand explains only direction of change in quantity demanded but does not tell us by how much amount the quantity demanded changes due to change in the price. The response of quantity demanded to change in price of the commodity differs in different cases. This forms the subject matter of the study of price elasticity of demand.

OBJECTIVES

After completing this lesson, you will be able to:

● explain the meaning of elasticity of demand;

● explain the meaning of price elasticity of demand, income elasticity of demand and cross elasticity of demand;

● explain various degrees (types) of price elasticity of demand;

● explain methods of calculating price elasticity of demand;

● solve practical problems based on price elasticity of demand; and

● identify factors affecting price elasticity of demand.

16.1 MEANING OF ELASTICITY OF DEMAND

Demand for a commodity is affected by many factors such as its price, price of related goods, income of its buyer, tastes and preferences etc. Elasticity means degree of response. Elasticity of demand means degree of responsiveness of demand. Demand for a commodity responds to change in price, price of related goods, income etc. So, we have three dimensions of elasticity of demand:

(i) **Price elasticity of demand:** Price elasticity of demand means degree of responsiveness of demand for a commodity to the change in its price. For example, if demand for a commodity rises by 10% due to 5% fall in its price,

Price elasticity of demand (e_p)

$$= \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price of the commodity}}$$

$$= \frac{10}{(-)5} = (-)2$$

Note that e_p will always be negative due to inverse relationship of price and quantity demanded.

(ii) **Income elasticity of demand:** Income elasticity of demand refers to the degree of responsiveness of demand for a commodity to the change in income of its buyer. Suppose, income of buyer rises by 10% and his demand for a commodity rises by 20%, then,

Income elasticity of demand (e_y)

$$= \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price of the commodity}}$$

$$= \frac{20}{10} = 2$$

(iii) **Cross Elasticity of demand:** Cross elasticity of demand means the degree of responsiveness of demand for a commodity to the change in price of its related goods (substitute goods or complementary goods). Suppose, demand for a commodity rises by 10% due to 5% rise in price of its substitute good, then

Cross elasticity of demand (e_c)

$$= \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price of related good}}$$

$$= \frac{10}{5} = 2$$

(Tastes and preferences cannot be expressed numerically. So elasticity of demand cannot be numerically expressed.)

Notes

16.2 DEGREES (TYPES) OF PRICE ELASTICITY OF DEMAND

You must have noticed that when price of salt rises, we go on consuming the same quantity of salt. In other words, quantity demanded of salt does not respond to the change in its price. But what happens when price of apples rises? We start purchasing less quantity of apples at higher price i.e. demand for apples responds when their price changes. So, degree of responsiveness of quantity demanded to a change in price may differ i.e. elasticity of demand could also differ. In this context, the price elasticity of demand is generally classified into following five categories:

(i) **Perfectly inelastic demand ($e_d = 0$)** : The demand for a commodity is called perfectly inelastic when quantity demanded does not change at all in response to change in its prices (See table 16.1). Graphically, the demand curve in parallel to y-axis as shown in Fig. 16.1.

Table 16.1

Price (₹ Per kg.)	Quantity demanded (In kgs.)
10	2
15	2
20	2
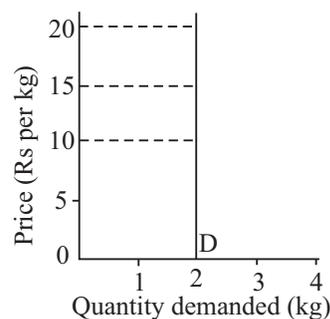
Fig. 16.1

(ii) **Less than unit elastic demand ($e_d < 1$) :** The demand for a commodity is called less than unit elastic or relatively inelastic when the percentage change in quantity demanded is less than the percentage change in price of the commodity (See table 16.2). Graphically, demand curve is steeper as shown in Fig. 16.2. The demand for necessary goods like medicines and food items etc. is less than unit elastic.

Table 16.2

Price (₹ Per kg.)	Quantity demanded (In kgs.)
10	4
20	3
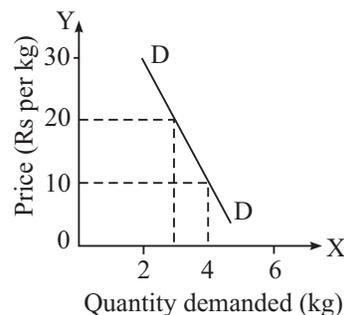
Fig. 16.2

You can see in table 16.2 that fall in quantity demanded is 75% in response to rise in price by 100%.

(iii) Unit elastic demand ($e_d = 1$): When percentage change in quantity demanded of a commodity equals percentage change in its price, the demand for the commodity is called unit elastic (See table 16.3). Graphically, demand curve is rectangular hyperbola as shown in fig. 16.3

(Rectangular hyperbola is a curve on which all the rectangles formed on the curve have same area).

Table 16.3

Price (₹ Per meter)	Quantity demanded (In meters)
20	40
30	20

You can see in table 16.3 that fall in quantity demanded is 50% in response to rise in price by 50%.
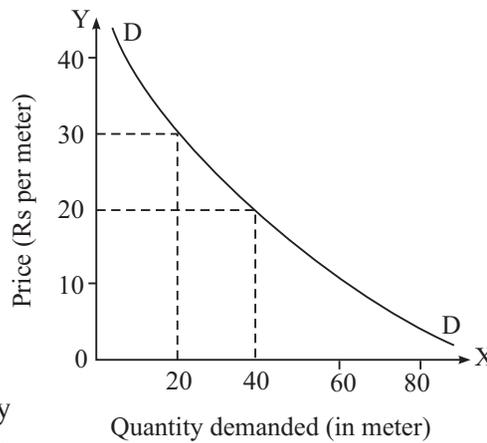
Fig. 16.3

(iv) More than unit elastic demand ($e_d > 1$): When the percentage change in quantity demanded of a commodity is more than the percentage change in its price, the demand for the commodity is called more than unit elastic or highly elastic (see table 16.4). Graphically, the demand curve is flatter as shown in fig. 16.4. The demand for luxury goods is more than unit elastic.

Table 16.4

Price (₹ Per unit)	Quantity demanded (In units)
100	400
150	100

Fig. 16.4

In table 16.4 the quantity demanded has fallen by 75% in response to 50% rise in the price of the commodity.
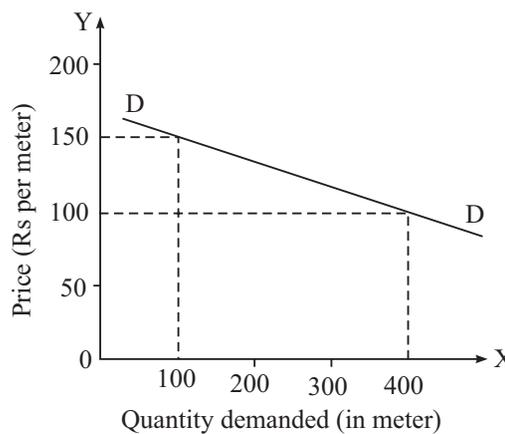
(v) Perfectly elastic demand ($e_d = \infty$): The demand for the commodity is called perfectly elastic when its demand expands or contracts to any extent without

or very little change in its price (see table 16.5). Graphically, the demand curve is parallel to X-axis as shown in Fig. 16.5.

Table 16.5

| Price (₹ Per unit)	Quantity demanded (In units)
20	2
20	4

In table 16.5 the quantity demanded of the commodity rises by 100% without change in its price.
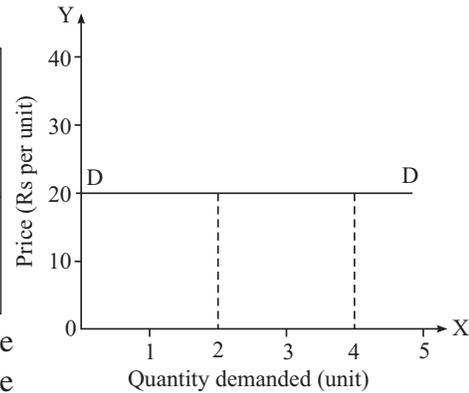
Fig. 16.5

INTEXT QUESTIONS 16.1

1. Define the following:

   (i) Price elasticity of demand

   (ii) Income elasticity of demand

   (iii) Cross elasticity of demand

2. When the demand for a commodity is called elastic?

3. What is the likely shape of the demand curve when the demand for a commodity is unitary elastic?

16.3 METHODS OF MEASUREMENT OF PRICE ELASTICITY OF DEMAND

There are following two methods of measurement of price elasticity of demand:

(i) Percentage change method

(ii) Geometric method

In addition to the above mentioned two methods, we will also explain the measurement of price elasticity of demand on the basis of change in total expenditure incurred on the commodity.

16.3.1 Percentage Change Method

This method is also called **'proportionate method'** or flux method. According to this method price elasticity of demand is measured as a ratio of percentage change

in quantity demanded to the percentage change in price of the commodity.

Price elasticity of demand (e_d)

$$= \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price of the commodity}}$$

Percentage change in quantity demanded

$$= \frac{\text{Change in quantity } (\Delta Q)}{\text{Initial quantity } (Q)} \times 100$$

Percentage change in price $= \dfrac{\text{Change in price } (\Delta P)}{\text{Initial price } (P)} \times 100$

Notes

Therefore,
$$e_d = \frac{\dfrac{\Delta Q}{Q} \times 100}{\dfrac{\Delta P}{P} \times 100}$$

Where ΔQ = Change in quantity demanded

Q = Initial quantity demanded

ΔP = Change in price

P = Initial price

Illustration 1

Calculate price elasticity of demand if quantity demanded of a commodity rises by 20% due to 8% fall in its price.

Solution:

Price elasticity of demand $= \dfrac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price of the commodity}}$

$$= \frac{20}{(-)8} = (-)\,2.5$$

[This is to be noted that price elasticity of demand is always a negative number because of inverse relationship between price and quantity demanded. However, minus sign is often ignored while writing the value of elasticity.]

Notes

Illustration 2

When price of a commodity is ₹ 10 per unit, its demand is 100 units. When the price falls to ₹ 8 per unit, demand expands to 150 units. Calculate price elasticity of demand.

Solution:

$$e_d = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price of the commodity}}$$

$$\text{Percentage change in quantity demanded} = \frac{(150-100)}{100} \times 100 = 50\%$$

$$\text{Percentage change in price} = \frac{(-)2}{10} \times 100 = (-)20\%$$

So,

$$e_d = \frac{50}{(-)20} = (-)2.5$$

We can also use the simplified formula for percentage change method.

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

$$= \frac{150-100}{(8-10)} \times \frac{10}{100}$$

$$= \frac{50}{(-)2} \times \frac{10}{100}$$

$$= (-)\,2.5$$

Illustration 3

Price elasticity of demand of a commodity is (–) 2. A consumer demands 50 units of this commodity when its price is ₹ 10 per unit. At what price he will demand 40 units of this commodity?

Solution:

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

$\Rightarrow$ $\qquad$ $(-)2 = \dfrac{40-50}{\Delta P} \times \dfrac{10}{50}$

$\Rightarrow$ $\qquad$ $-2 = \dfrac{(-)10}{\Delta P} \times \dfrac{10}{50}$

$\Rightarrow$ $\qquad$ $\Delta P = \text{Re } 1 \text{ per unit}$

$\qquad$ New price $= 10 + 1$

$\qquad\qquad\qquad = ₹ \, 11 \text{ per unit}$

16.3.2 Geometric Method

This method is also known as 'point method'. Geometric method is used to measure the elasticity at a point on the straight line demand curve. Elasticity of demand is different at different points on the same straight line demand curve.

According to the geometric method, elasticity of demand at any point of a straight line demand curve is measured as a ratio of lower segment of the demand curve and upper segment of the demand curve

$$e_d = \frac{\text{Lower segment of the demand curve}}{\text{Upper segment of the demand curve}}$$

Let us consider a straight line demand curve AB at which elasticity of demand is to be measured at point C, D, M, N, and P (Fig. 16.5).
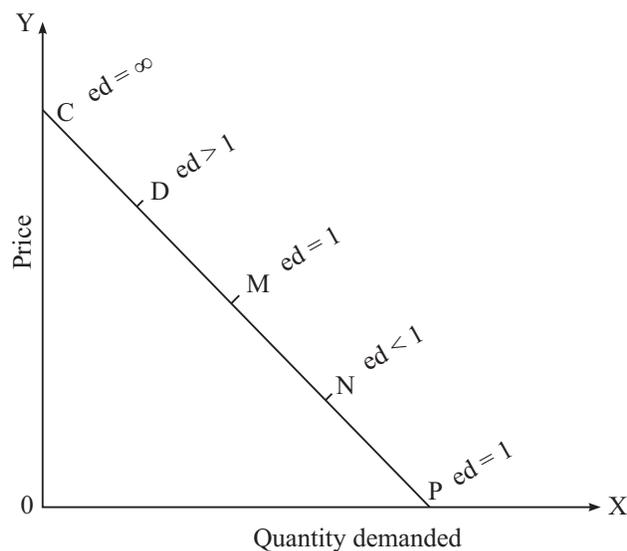
Fig. 16.6

M is the mid-point of the demand curve AB.

So, e_d at point M = $\dfrac{\text{Lower segment of the demand curve}}{\text{Upper segment of the demand curve}}$

$$= \dfrac{MP}{MC} = 1$$

(Because MP= MC)

$$e_d \text{ at point N} = \dfrac{NP}{NC}$$

Point N is below point M so NP is less than NC and elasticity will be less than one.

$$e_d \text{ at point P} = \dfrac{0}{PC} = 0$$

(Here lower segment is 0)

$$e_d \text{ at point D} = \dfrac{DP}{DC}$$

Point D is above point M. So, DP is more than DC. Elasticity at this point will be more than one.

$$e_d \text{ at point C} = \dfrac{CP}{0} = \infty$$

(Upper segment is 0)

So, we can conclude that elasticity at mid-point of a straight line demand curve will be 1, elasticity at every point below the mid-point will be less than one and elasticity at every point above the mid-point will be greater than one.

16.4 RELATIONSHIP BETWEEN TOTAL EXPENDITURE AND PRICE ELASTICITY OF DEMAND

We have studied that price of a good and its quantity demanded are inversely related. So, responsiveness of demand in relation to change in price i.e. price elasticity of demand determines the change in expenditure. We can consider the following cases:

(i) **Elasticity is less than one ($e_d < 1$):** When the demand for a commodity is less than unit elastic, a fall in price leads to fall in total expenditure and a rise in price leads to rise in total expenditure on the commodity. (Price of the commodity and total expenditure move in same direction).See table 16.6.

Table 16.6

Price (₹ Per unit)	Quantity Demanded (In Units)	Total Expenditure (In ₹)
12	10	120
10	11	110
8	12	96

(ii) **Elasticity is more than unit elastic ($e_d > 1$):** When the demand for a commodity is more than unit elastic, a fall in price leads to rise in total expenditure and a rise in price leads to a fall in total expenditure on the commodity. (Price of the commodity and total expenditure move in opposite direction).See table 16.7.

Table 16.7

Price (₹ Per unit)	Quantity Demanded (In Units)	Total Expenditure (In ₹)
12	10	120
10	14	140
8	20	160

(iii) **Elasticity is equal to one ($e_d = 1$):** When the demand for a commodity is unit elastic, total expenditure incurred on the commodity does not change with the change in its price. See table 16.8.

Table 16.8

Price (₹ Per unit)	Quantity Demanded (In Units)	Total Expenditure (In ₹)
12	10	120
10	12	120
8	15	120

All the three cases discussed above are shown diagrammatically in Fig. 16.7

Notes
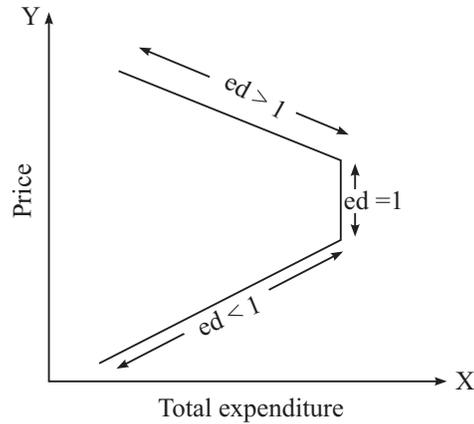
Fig. 16.7

Illustration 1:

Due to 2% fall in price of good X total expenditure on good X rises by 3%. A 10 % rise in price of good Y leads to 20 % rise in total expenditure on good Y. Using total expenditure method, compare price elasticity of demand of good X and good Y.

Solution:

Demand for good X is more than unit elastic because price of the commodity and total expenditure on the commodity move in opposite direction.

Demand for good Y is less than unit elastic because price of the commodity and total expenditure on the commodity move in same direction.

Illustration 2:

When the price of a good changes to ₹ 11 per unit, the consumer's demand falls from 11 units to 7 units. The price elasticity of demand is (–) 1. What was the price before change? Use expenditure approach of price elasticity of demand to answer this question.

Solution:

Price (₹ Per unit)	Quantity Demanded (In Units)	Total Expenditure (In ₹)
?	11	?
11	7	77

As the price elasticity of demand is (–) 1 i.e. unit elastic, so, total expenditure will remain unchanged at ₹ 77. Therefore, price before change was 77/11 = ₹ 7 per unit

Notes

Illustration 3:

When price of a good falls from ₹ 10 per unit to ₹ 9 per unit, its demand rises from 9 units to 10 units. Compare expenditures on the good to find price elasticity of demand.

Price (₹ Per unit)	Quantity Demanded (In Units)	Total Expenditure (In ₹)
10	9	90
9	10	90

The demand for the good is unit elastic as the total expenditure remains unchanged at ₹ 90 when its price falls.

16.5 FACTORS AFFECTING PRICE ELASTICITY OF DEMAND

As discussed earlier, in case of some goods responsiveness of quantity demanded to the change in price is more than some other goods. For example, a very small change in price of luxury goods may affect their demand to a considerable extent but a large change in price of salt may not affect its demand. This means, price elasticity of demand is different for different goods. Following factors may affect the price elasticity of demand for a good:

(i) **Availability of close substitutes:** Demand for a commodity which has large number of substitutes, is usually more elastic than those commodities which have no substitutes. For example, coke, Pepsi, limca etc. are good substitutes. Even a small rise in price of coke will induce the buyers to go for its substitutes. On the other hand demand for electricity will be less elastic because it has no close substitutes.

(ii) **Nature of the Commodity:** Demand for necessities like medicines, food grains is less elastic because we have to consume them in minimum required quantity, whatever their price may be. But demand for comforts and luxuries like refrigerators, air conditioners etc. is more elastic because their consumption may be postponed for future if their price rises.

(iii) **Share in Total Expenditure:** Greater the proportion of income spent on the commodity, more is the elasticity of demand for it. Demand for a commodity is inelastic if proportion of income spent on that commodity is very small.

(iv) **Level of Price:** Demand for a commodity at higher level of price (like air conditioners, cars etc.) is generally more elastic than for a commodity at lower level of price (like match box, pencils etc.)

(v) **Level of Income:** Demand for a commodity is generally less elastic for higher income level groups in comparison to people with low incomes. For example,

if price of a good rises, a rich consumer is not likely to reduce his demand but a poor consumer can reduce his demand for that commodity.

(vi) Habits: Habits of consumers also determine price elasticity of demand of commodities. For example, a chain smoker will not restrict his smoking even when the price of cigarettes rise.

INTEXT QUESTIONS 16.2

1. Due to 5% fall in price of a commodity its demand rises by 7.5%. Calculate and state coefficient of price elasticity of demand. Whether the demand is elastic or inelastic? Give reason.

2. Write formula for measuring price elasticity of demand at a point on a straight line demand curve.

3. The total expenditure on a commodity falls when its price rises. Comment on the price elasticity of demand of the commodity.

4. State any two factors which may affect price elasticity of demand of a commodity.

5. Why is the demand for water inelastic?

WHAT YOU HAVE LEARNT

- Price elasticity of demand is the degree of responsiveness of demand for a commodity to the change in its price.

- When quantity demanded of a commodity does not change at all in response to change in its price, the demand for the commodity is called perfectly inelastic.

- The demand for a commodity is called less than unit elastic when the percentage change in quantity demanded is less than the percentage change in its price.

- The demand for a commodity is called unit elastic when the percentage change in quantity demanded equals the percentage change in its price.

- The demand for a commodity will be more than unit elastic if the percentage change in quantity demanded is more than the percentage change in its price.

- When the demand for a commodity expands or contracts to any extent without or very little change in its price, its demand is called perfectly elastic.

Notes

- By percentage method, price elasticity of demand can be ascertained by the formula:

$$e_d = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in price of the commodity}}$$

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

- Price elasticity of demand at mid- point of a straight line demand curve will be 1, elasticity at every point below the mid- point will be less than 1 and elasticity at every point above mid- point will be greater than 1.

- When the demand for a commodity is less than unit elastic, price of the commodity and total expenditure on the commodity move in same direction.

- When the demand for a commodity is more than unit elastic, price of the commodity and total expenditure on the commodity move in opposite direction.

- When the demand for a commodity is unit elastic, total expenditure incurred on the commodity does not change with the change in its price.

- Price elasticity of demand of a commodity is influenced by (i) availability of close substitutes, (ii) nature of the commodity, (iii) share in total expenditure, (iv) level of price, (v) level of income and, (vi) habits etc.

TERMINAL EXERCISE

1. Draw diagrams for:
   (i) Perfectly elastic demand
   (ii) Perfectly inelastic demand
   (iii) Unit elastic demand

2. Prepare a schedule for:
   (i) More than unit elastic demand
   (ii) Less than unit elastic demand

3. Explain 'percentage change' method of measuring price elasticity of demand.

4. Explain the relationship between total expenditure incurred on a commodity and its price elasticity of demand.

5. How is price elasticity of demand of a commodity affected by availability of its close substitutes? Explain.

Notes

6. A household purchases 40 units of a good when its price is Re. 1 per unit. At what price he would purchase 36 units of it if coefficient of price elasticity of demand is unitary.

7. What quantity of a commodity would a household purchase at a price of ₹ 12 per unit, if he purchases 40 units of it at ₹ 10 per unit? Price elasticity of demand is (-) 1.5.

8. A household spends ₹ 120 on purchase of a commodity when its price is ₹ 6 per unit. When price rises to ₹ 10 per unit, his total expenditure on this commodity becomes ₹ 180. Calculate price elasticity of demand by percentage change method.

9. When price of a commodity falls from ₹ 20 per unit to ₹ 16 per unit, its quantity demanded increases by 20%. Calculate coefficient of price elasticity of demand.

10. A consumer buys 15 units of a good at a price of ₹ 10 per unit. At price ₹ 15 per unit he buys 10 units. What is price elasticity of demand? Use expenditure approach. Comment on the likely shape of demand curve on the basis of this measure of elasticity.

ANSWER TO INTEXT QUESTIONS

16.1

1. Read section 16.1

2. Read section 16.2(iv)

3. Rectangular hyperbola

16.2

1. e_d = 1.5, Demand is more than unit elastic because percentage change in quantity demanded is more than the percentage change in price of the commodity.

2. $e_d = \dfrac{\text{lower segment of demand curve}}{\text{Upper segment of demand curve}}$

3. Demand for the commodity is more than unit elastic because price and total expenditure move in opposite direction.

4. (i) Nature of the commodity (ii) Availability of close substitutes

5. Demand for water is inelastic because water is a necessity.

MODULE - VII
PRODUCER'S BEHAVIOUR

17

PRODUCTION FUNCTION

When you go to the market to buy commodities such as note-books, fountain pens, shirts, bread, butter, fruits, vegetables etc. do you ever think about how these things came into the market. In previous lessons, you have studied about consumers, who constitute one part of the market and demand goods and services to satisfy their wants. Now, you will study the other part of the market - the producers or firms who produce goods and services for the satisfaction of consumers' wants. A producer or firm combines various factors inputs like land, labours, capital, entrepreneurship and other inputs like raw material, fuel etc. to produce goods and services that are demanded by the consumers. Man can neither produce a physical product nor can he distruct. Man can change only the form of a physical product. He can create utilities only. Thus production means creation or addition of utility. Any activity that makes a product more useful is collect production. In this lesson you will study about how these inputs are combined to produce goods and services.

OBJECTIVES

After completing this lesson, you will be able to:

- explain the meaning of production;
- define production function;
- understand the meaning of production function in the short run known as law of variable proportions;
- understand the different concepts of production and show their relationships;
- differentiate between fixed and variable factors of production or inputs; and
- explain the reasons of operation of the laws of production.

17.1 MEANING OF PRODUCTION

Production may be defined as a process through which a firm transforms inputs into output. It is the process of creating goods and services with the help of factors of production or inputs for satisfaction of human wants. In other words, 'transformation of inputs into output' whereby value is added, is broadly called production. Whatever is used in the production of a commodity is called input. For example, in the production of wheat, the use of land, seed, fertilizer water, pesticides, tractors, labour etc. are inputs and wheat is output. The relationship between inputs and output of a commodity depends upon the state of technology because with the help of advanced technology more can be produced with the help of same inputs or same output can be produced with the help of less inputs.

Before defining production function we should understand the following concepts related to production function:

(a) Short run and long run

Short run refers to a time period in which a firm does not have sufficient time to increase the scale of output. It can increase only the level of output by increasing the quantity of a variable factor and making intensive use of the existing fixed factors. On the other hand long run refers to the time period in which the firms can increase the scale of output by increasing the quantity of all the factor inputs simultaneously and in the same proportion.

The distinction between fixed and variable factors is relevant only in the short run but this distinction disappears in the long run.

(b) Fixed factors and variable factors

Fixed factors are those factors of production whose quantity can not be hanged with change in the level of output. For example, the quantity of land, machinery etc. can not be hanged during short run.

On the other hand, variable factors are those factors of production whose quantity can easily be hanged with change in the level of output. For example, we can easily change the quantity of labour to increase or decrease the production.

(c) Level of production and scale of production

When any firm increases production by increasing the quantity of one factor input where as the quantity of other factor inputs keeping constant; it increases the level of production. But on the other hand, when the firms increases production by increasing the quantity of all the factors of production simultaneously and in the same proportion, it increases the scale of production.

17.2 DEFINITION OF PRODUCTION FUNCTION

In economics, production function refers to the physical relationship between inputs and output under given technology. In otherwords production function is a mathematical functional/technical/engineering relationship between inputs and output such that with a given combination of factor inputs and technology at a given period of time, the maximum possible output can be produced. Such as land, labour capital and entrepreneurship.

If there are two factor inputs: labour (L) and capital (K), then production function can be written as:

$Q_x = f(L, K)$ where Q_x is the quantity of output of commodity x, f is the function and L and k are the units of labour and capital respectively. It says that quantity of output depends on units of labour on capital used in production.

Here two points are worth considering. Firstly, production function must be considered with reference to particular period of time i.e. short period and long period. Secondly, production function is determined by state of technology.

(i) Short run production function

A production function that shows the changes in output when only one factor is changed while other factor remains constant is termed as a short run production function. In the above example of production funciton, Labour (L) is considered as the variable factor which can be changed to influence the level of output. The other factor capital (K) is a fixed factor which can not be changed. The underlying theory to the short run production function is the "Law of variable proportion or Returns to a factor". This law will be discussed later in this chapter.

(ii) Long run production function

A long run production function studies the impact on output when all the factors of production can be changed simultaneously and in the same proportion. So in the long run size of operation of the firm can be expanded or contracted depending on the fact that the factors of production are increased or decreased. The underlying theory to the long run production function is the returns to scale which will be discussed later in this lesson:

Notes

INTEXT QUESTIONS 17.1

(i)   What is meant by production?

(ii) Define a production function.

Notes

(iii) Distinguish between short-run production function and long-run production function.

Before studying the law of variable proportions we have to understand the three measures of production and their relationships because without understanding these measure of production, the concepts of laws of production can not be clearly understood.

There are mainly the following three measures of production:

(a) Total product or total physical product denoted by TPP.

(b) Average Product (AP) or Average physical produt denoted by APP.

(c) Marginal Product (MP) or marginal physical product denoted by MPP.

(a) Total Physical Product (TPP)

TPP is the total amount of a commodity that is produced with a given level of factor inputs and technology during a given period of time. For example, 2 units of labour combined with 2 units of capital can produce 26 fans per day. Here 26 fans is the total physical produt which is produced with the given level of inputs (labour and capital)

(b) Average Physical Produt (APP)

APP is the output produced per unit of input employed. It can be obtained by dividing TPP by the number of units of variable input. So APP = TPP/L where L is the units of labour. For example, if 10 workers make 30 chairs per day, the APP of a worker per day will be $30 \div 10 = 3$ chairs. If the productivity of a factor increases, it implies that the output per unit of input has increased.

(c) Marginal Physical Product (MPP)

MPP of an input is the additional output that can be produced by employing one more unit of that input while keeping other inputs constant. For example, if ten tailors can make 50 shirts per day and 11 tailors can make 54 shirts per day, the marginal product of 11 workers will be 54 - 50 = 4 shirts per day.

We can further clarify the above three concepts of production with the help of the following table 17.1.

Table showing TPP, APP and HPP of fans per day in short run.

Table 17.1

Fixed factor (Capital units)	Variable factor (Labour units)	TPP (units)	APP (units)	MPP (units)
(1)	(2)	(3)	(4)	(5)
2	1	10	10	10
2	2	26	13	16
2	3	48	16	22
2	4	68	17	20
2	5	85	17	17
2	6	96	16	11
2	7	98	14	2
2	8	98	12.25	0
2	9	90	10	-8

The above table shows values of TPP, APP and MPP for different units of variable factor. For example, if we know the TPP of all the units of variable factor we an calculate APP by dividing TPP by the number of units of a variable factor. So APP = TPP/units of variable factor. For example in table 17.1 the TPP of 2 units of labour is 26, the APP will be $26 \div 2 = 13$. In the same way we an calculate APP of all the units of a variable factor. We calculate MPP of 2 units labour by deducing TPP of 1 unit. From the TPP of 2 units labour i.e. $26 - 10 = 16$ units. So $MPP_n = TPP_n - TPP_n - 1$. If we know APP of all the units of a variable input we can calculate TPP by multiplying APP by the units of variable factor. In the above table APP of 4 units of labour is 17. TPP will be $17 \times 4 = 68$ units. In the source way we an calculate TPP of all other units of variable factor. So TPP = APP × L where L is the units of labour. If we know MPP of all the units of a variable we an calculate TPP by summing up the MPP of all the units of variable factor. For example, in table 17.1 the MPP of 1, 2, 3 and 4 units of labour are 10, 16, 22 and 22 and 20 respectively, the TPP of 4 units of labour can be derived by summing up the MPP of these 4 units of labour i.e. $10 + 16 + 22 + 20 = 68$ units. TPP of all other units can be calculated in the same manner. Remember that for the 1 unit of labour TPP, APP and MPP are equal. So we can give the following formulas to calculate TPP, APP and MPP.

TPP = ΣMPP (Sum of MPP of all the units of a variable factor)

or TPP = $MPP_1 + MPP_2 + MPP_3 +$ .... MPP_n

or TPP = APP × L where L indicates units of labour

APP = $\dfrac{TPP}{L}$ where L indicates units of labour

Notes

$$MPP = \frac{\Delta TPP}{\Delta L}$$ where ΔTPP is change in TPP and ΔL is change in units of labour

or $MPP_n = TPP_n - TPPn - 1$ for example, MPP of 2 units = TPP of 2 units – TPP of 1 units of labour

17.4 RELATIONSHIP BETWEEN TPP AND MPP

The relationship between TPP and MPP can be explained as given below:

(i) As long as MPP increases, TPP increases at an increasing rate.

(ii) When MPP falls but remains positive, TPP increases but at a diminishing rate.

(iii) When MPP becomes zero, TPP is maximum.

(iv) If MPP becomes negative, TPP starts decreasing.

17.5 RELATIONSHIP BETWEEN APP AND MPP

(i) As long as MPP is greater than APP, APP increases.

(ii) When MPP is equal to APP, APP is maximum and constant.

(iii) When MPP is less then APP, APP decreases.

(iv) MPP can be zero and negative but APP is never zero or negative.

The relationship among TPP, APP and MPP can also be explained with the help of the following table. 17.2

Table 17.2: Hypothetical schedule of TPP, APP and MPP

Land (Fixed factor)	Units of variable Factor (labour)	TPP (Units)	APP Units) (TPP/L)	MPP (Units) ($\Delta TPP/\Delta L$)
1 Acre	0	0	–	–
1 Acre	1	2	2	2
1 Acre	2	6	3	4
1 Acre	3	12	4	6
1 Acre	4	20	5	8
1 Acre	5	25	5	5
1 Acre	6	29	4.8	4
1 Acre	7	31	4.4	2
1 Acre	8	31	3.9	0
1 Acre	9	29	3.2	–2

In the above table 17.2 MPP is increasing upto 4 units of labour and TPP is increasing at an increasing rate. MPP is decreasing but remains positive from 5th to 8th unit of labour so TPP is increasing at a diminishing rate. For 8th unit of labour MPP is zero where TPP is maximum. But for 9th unit of labour MPP becomes negative so TPP also starts decreasing.

In the same way upto 4 units of labour MPP is greater than APP, so APP is increasing. At 5th units of labour MP = APP so APP is maximum and constant. At 6th units of labour MPP is less than APP, So APP is decreasing.

Relationship among TPP, APP and MPP (through diagram)

To understand the relationship among TPP, APP and MPP, let us considers the following diagram.
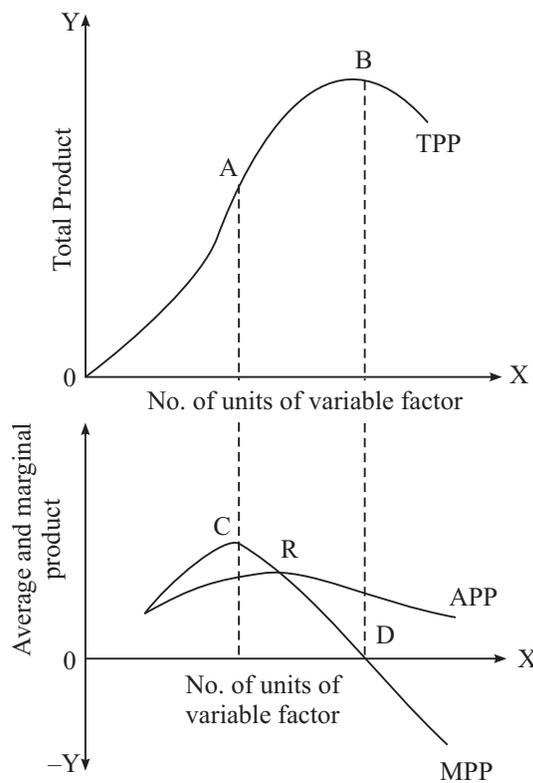
Fig. 17.1

In the above figure 17.1 TPP increases from point O to pint B. There are two phases of this increase in TPP. First, from O to A in which TPP increases at on increasing rate. In this phase in the lower portion of the diagram MPP increases upto point

C. So we can conclude that when MPP increases TPP increases at an increasing rate. Second phase of increase in TPP is from A to B in which TPP increases at a diminishing rate. In the lower portion of the diagram, MPP decreases from point C to point D but it remain positive. So we can conclude that when MPP falls but remains positive, TPP increases at a diminishing rate. At point B on TPP curve, TPP is maximum. In the lower portion of the diagram MPP is zero at point D. So we conclude that where MPP is zero, TPP is maximum. After point B, TPP falls. After point D MPP becomes negative and TPP falls.

In the lower portion of the above figure 17.1, APP and MPP curves have been drawn. Before point R on APP curve, MPP is greater than APP, so APP increases. At point R MPP is equal to APP. At this point. APP is constant and maximum. After point R on APP curve, MPP curve is below APP curve, so we can say that when MPP is less than APP, APP falls.

INTEXT QUESTIONS 17.2

1. What are primary inputs? Give example.

2. What are secondary inputs? Give example.

3. Define variable factors of production.

4. What are fixed factors of productions? Explain with example.

5. Distinguish between fixed and variable factors of production.

6. Can total product ever decline? If yes, when?

7. What happens to TPP when MPP is zero?

8. What happens to TPP when MPP increases?

9. Explain the relationship between TPP and MPP.

10. What is the relationship between APP and MPP?

17.6 LAW OF VARIABLE PROPORTIONS

The law of variable proportions is a short period production law. It is also called returns to a factor. Let us first understand the meaning of variable proportions. In a production process when only one factor is varied and all other factors remain constant, as more and more units of variable factor are employed, the proportion between fixed and variable factors goes on changing. So it is termed as the law of variable proportions. This law states that if you go on using more and more units of variable factor (labour) with fixed factor (capital), the total output initially

increases at an increasing rate but beyond a certain point, it increases at a diminishing rate and finally it falls. This law was initially called the law of dimiting returns Marshall who applied the law only in agriculture sector but modern economist called it the law of variable proprotion and proposed its applicability to all the sectors of the economy.

Assumption of the law

The law operates under the following assumptions:

(i)   The firm operates in the short run.

(ii) There is no change in technology of production.

(iii) The production process allows the different factor ratios to produce different levels out output.

(iv) All the units of variable factor are equally efficient.

(v)   Full substitutability of factors of production is not possible.

According to the law when we employ more and more units of a variable factor with the fixed quantity of other factors and technology, the marginal product of the variable factor first increases and then decreases. In other words, with employment of more and more units of a variable factor with fixed quantity of other factors, the total product first increases and then starts decreasing. It means that in short run labour is the only variable factor, Return to labour or marginal product of labour initially increases but as more units of labour are employed its MPP declines and may also become negative. There are three phases of returns to a variable factor which are discussed below.

(a) Phase I: Increasing Returns to a factor

In this phase TPP increases at an increasing rate and marginal product of variable factor, labour increases. In the end of this phase MPP is maximum. So, this is the phase of increasing returns to a factor.

(b) Phase II: Diminishing Returns to a factor

In this phase TPP increases but at a diminishing rate MPP declines but remains positive. At the end of this phase MPP is zero. At this point TPP is maximums. So, this is the phase of diminishing returns to a factor.

(c) Phase III: Negative Returns to a factor

In this phase, MPP declines and it becomes negative. Here the TPP also starts falling. It operates from the level of output where MPP of labour is zero but subsequently becomes negative. The table 17.2 given below illustrates the three phases of the law of variable proportions.

Notes

Table 17.2: Low of variable proportions

Units of land (Fixed input)	Units of labour (variable input)	TPP (units)	MPP (units)	Phases
1	1	3	3	TPP increase at an increasing rate
1	2	7	4	→ MPP is increasing (Phase I)
1	3	12	5	
1	4	16	4	TPP increases at a diminishing rate
1	5	19	3	and MPP falls but remains
1	6	21	2	→ positive (Phase II)
1	7	22	1	
1	8	22	0	
1	9	21	–1	TPP falls and MPP becomes
1	10	20	–2	negative (Phase III)

This law can also be explained with the help of figure given below.
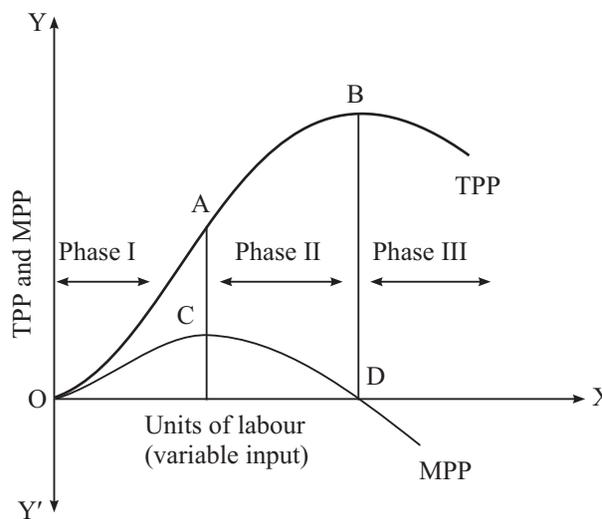
Fig. 17.2

The figure 17.2 given above shows that TPP increases from 0 to B but there are two parts of this increase. First is from 0 to A in which TPP increases at an increasing rate. This is in the I phase of the law. In this phase MPP increases from 0 to C.

In the second part from A to B TPP increases at a diminishing rate. This is in the II phase of the law. In this phase MPP decreases from point C to point D. At point D MPP is zero. TPP is maximum at point B.

After point B TPP starts falling. This is in III phase of the law. In this phase MPP becomes negative after point D.

17.7 REASONS BEHIND DIFFERENT PHASES OF THE LAW OF VARIABLE PROPORTIONS

In phase I, we get increasing returns to a variable input because greater use of variable inputs makes it possible to utilize fixed indivisible factor more efficiently and also to introduce a greater division of labour and specialization. It leads to optimum combination of fixed and variable inputs.

In phase II, we get diminishing returns to a variable input because in this stage the proportion between variable and fixed inputs has crossed the optimum proportion between them and a variable input such as labour has less and less fixed input to work with.

In phase III, the variable input becomes too much relative to fixed inputs which obstructs the production process and therefore results in fall of TPP. because MPP becomes negative. So, phase III is called the stage of negative returns to variable factor. So phase III is called the stage of negative returns to variable factor.

17.8 LAW OF DIMINISHING MARGINAL PRODUCT

The law of variable proportions is an extension of the law of diminishing returns to a factor. The law of diminishing returns to a factor states that as more and more units of a variable factor are employed with fixed factors and technology, its marginal product eventually declines. The difference between this law and the law of variable proportions is that the former does not take into account increasing returns to a factor. According to the law of diminishing returns to a factor, the firm can operate only in phase II and III of the law of variable proportions. Hence the law of diminishing returns to a factor is a part of more general law of variable proportions. In figure 17.2, the law of diminishing returns to a factor operates after point A on TPP curve and point C on MPP curve.

Early economists believed that the diminishing returns to a factor sets in only in agriculture as land was fixed. It did not apply in industry as this sector continuously underwent technical upgradation. However, industry can postpone setting in of diminishing returns with technical advances. If technical advancements do not take place there is no increase in the efficiency of the factor inputs, then diminishing returns shall be applicable even in industry. According to modern economists, diminishing returns under the law of variable proportions are universally applicable to both the agriculture and industrial sectors.

Notes

WHAT YOU HAVE LEARNT

- Production is the process of converting inputs into output.
- A production function shows the technical relationship between inputs and output.
- Fixed factors are those whose quantity does not change with change in output.
- Variable factors are those whose quantity changes with change in output.
- TPP is defined as the total output that is produced in a given time with given inputs and technology.
- APP is the output per unit of input.
- MPP is the addition to TPP by the employment of on additional unit of input.
- Relationship between TPP and MPP
  - (i)   When MPP increases, TPP increases at an increasing rate.
  - (ii) When MPP decreases but remains positive, TPP increases at a diminishing rate.
  - (iii) When MPP is zero, TPP is maximum.
  - (iv) When MPP become negative, TPP starts decreasing.
- Relationship between TPP and MPP:
  - (i)   As long as MPP is greater than TPP, APP increases.
  - (ii) When MPP is equal to APP, APP is constant and maximum.
  - (iii) When MPP is less than APP. APP decreases.
- The law of variable proportion states that as the additional units of a variable factor are combined with a given level of fixed factors and technology, the MPP of the varible factor first increases and then declines.
- There are three phases of the law of variable proportions:
  - (i)   In phase I, increasing returns to a factor occur return MPP is increasing and TPP increases at an increasing rate:
  - (ii) In phase II, diminishing returns to a factor occur, taken MPP is declining but remain positive and TPP increase at a diminishing rate.

    In phase III, negative returns to a factor occur when MPP is negative and TPP starts fallowing.

TERMINAL EXERCISE

1. Define production

2. Define production function

3. Distinguishes between short period and long period production functions.

4. What is meant by IPP?

5. Define APP.

6. Define MPP.

7. Explain the relationship between TPP and MPP.

8. Explain the relationship between APP and MPP.

9. Explain the law of variable proportions with the help of a schedule and a diagram.

10. What are the reasons of the operation of law of variable proportions?

11. What are general shapes of APP and MPP?

12. Distinguish, between fixed factors and variable factors.

Notes

ANSWERS IS INTEXT QUESTIONS

17.1

(i)   Reads section 17.1

(ii)   Reads section 17.2

(iii) Read sections 17.2 (i) and (ii) Basic concepts

17.2

(i)   Read section 17.3 (i) (Primary inputs)

(ii)   Read section 17.3 (ii) (Secondary inputs)

(iii) Read section 17.3 (i) Variable inputs)

(iv)   Read section 17.3 (ii) Fixed inputs)

(v)   Read section 17.3

(vi)   Read section 17.4

(vii) Read section 17.4

(viii) Read section 17.4

(ix)   Read section 17.4

(x)   Read section 17.5

18

COST OF PRODUCTION

Cost analysis is the life line of modern business. It cannot be ignored at any cost for the success of any business organisation. On anlysis of cost is required. A producer can supply/produce the product by organising the factors of produciton. That means the producer has to hire or purchase land, labour, capital, etc. by paying price. So, to produce the product the firm or producer must incur some expenditure and the expenditure so involved is called cost of production. This lesson is aimed at discussing this aspect of production called cost of production.

 OBJECTIVES

After completing this lesson, you will be able to:

- define cost of production;

- distinguish between the meaning of cost as used in business and as used in economics;

- explain the meaning and importance of various concepts of cost such as, explicit cost, implicit cost and normal profit, fixed costs and variable costs; and

- find out total fixed cost, total variable cost, average fixed cost, average variable cost, average total cost and marginal cost.

18.1 DEFINITION OF COST AND COST FUNCTION

Cost is defined as the expenditure incurred by a firm or producer to purchase or hire factors of production in order to produce a product. As you know, factors of production are land, labour, capital and entrepreneurship. In the production process, the entrepreneur organises land, labour, capital and raw materials to produce output. As a producer he/she has to pay rent for land, wages to labour and interest to procure capital. The producer must also be compensated for his/her

services which is called normal profit. Wages, rent, interest, profit are called factor costs of production. Besides these, the producer also incurs expenditure on raw materials, electricity, water, depreciation of capital goods such as machines and indirect taxes etc. The producer also uses the services of certain factors supplied by his/her own self. The imputed value of such inputs also form the part of cost.

Notes

Cost Function

Since the producer who produces output incurs cost, we can say that cost is a function of output. It means that cost of production will increase or decrease, depends on whether level output is increasing or decreasing.

In the lesson on production, you have studied that output depends on factors of production such as labour, capital. Hence cost is related to expenditure on these factors. If the producer hires more amount of factors, cost will automatically increase and vice versa.

18.2 TYPES OF COST

(a) Explicit Costs (Money Costs)

A firm purchases the services of assets like building, machine etc. It pays hiring charges for building, normally termed as rent. It employs workers, accountant manager etc. and pays wages and salaries to them. It borrows money and pays interest on it. It purchases raw material, pays electricity bills and makes such other payments. All such actual payments, on purchasing and hiring different goods and services used in production are called **'explicit costs'.**

Normally, in business, the accountant takes into account only the actual money expenditure as cost. So in business the cost is normally the **'explicit cost'** only.

(b) Implicit costs (Imputed costs) :

Many a times, we find that all inputs are not always bought or hired by the producer from the market. Some of the inputs are provided by the entrepreneur or producer himself. He may use his own building. He may invest his own money in the business. He may be the manager of his own firm. A farmer may cultivate his own land. If a producer had taken a building from another production unit, he would have paid rent. In the same way, if he had borrowed money he would have paid a certain amount of interest. Similarly, if he had engaged a manager he would have paid him a salary. But he is not paying these amounts explicitly i.e. (rent for his building, interest on his money and salary for his services) because he has contributed them for his own business. So market value of these self-owned and self supplied inputs must be calculated. It is, therefore, a cost to the producer. We can make an estimate

of these costs on the basis of their prevailing market prices. Let us term such costs as **'implicit costs'** (to distinguish them from explicit costs). These are also termed as imputed costs. One example of such cost is the imputed rent of the self owned factory building. It can be taken as equivalent to the actual rent paid for a similar type of building. Similarly, we can find out imputed interest and imputed wages.

In microeconomics, in addition to the paid out cost, imputed cost is also included in the cost of production.

Opportunity cost

Economists define opportunity cost as the value of next best alternative foregone. What does this mean? It is a common practicve that a person makes a list of several activities before adopting a particular one to persue his/her goal. Similarly, in production a producer leaves some alternatives before finally choosing to produce the particular output. So, while finally choosing one, the producer did forego the alternative production. Let us take example of a farmer. He can produce either rice or wheat on a piece of land. If he has decided to produce wheat on this piece of land, he has to forego the produciton of rice for producing wheat. So, value of rice foregone (next best alternative) is the opportunity cost of producing wheat.

18.3 NORMAL PROFIT AS COST OF PRODUCTION

Another component of cost is **'normal profit'.** Normal profit is an additional amount over the monetary and imputed cost that must be received by an entrepreneur to induce him to produce the given product. Normal profit is entrepreneur's opportunity cost and therefore enters into cost of production. Opportunity cost is the value of the opportunity or alternative that is sacrificed. You may be wondering how is it that profit is an element of cost. We will try to convince you.

For that let us first understand the meaning of the term **'normal profit'.** It is nothing but the minimum assured profit in the next best occupation. Normal profit is the reward which an entrepreneur must receive for the risk and uncertainties he bears in the production of a commodity. It can be understood with an example. Suppose there is a publisher who has the option of publishing commerce books or science books. He chooses to publish commerce books because he gets higher return from these. Now, suppose, that the market for science books is more assured but profit is lower. This would mean that the publisher who is publishing commerce books is sacrificing an assured return on science books and is taking a risk. He would be prepared to face the risk only when he thinks that he would be able to get at least the same profit which he would have in any way got from science books. Loss of assured return on science books is then an element of cost for the

publisher who is publishing commerce books instead of science books. It is termed as **'normal profit'** because it is an estimate of the minimum expectations of a producer from a business. So long as he gets this minimum, he will continue to publish commerce books. If, at any stage, he does not get this amount, he will shift to the publication of science books. So, in order that a producer continues to produce a commodity he must get normal profit in addition to recovering his **'explicit cost'** and **'implicit cost'.** We hope you are now convinced that minimum expectation of a producer from a business is also an element of cost.

There are three elements of the total cost of production in micro economics

(a)   Explicit costs

(b)   Implicit costs and

(c)   Normal profits.

In business accounts only explicit costs are treated as cost.

Let us consider an example of the total cost elements for a farmer, He requires following inputs to produce say rice; a piece of land; agricultural workers; tools and implements; tractor and harvester; water, seeds, manures, power, and many other things. He will either provide these inputs himself or he will purchase them from the market. Suppose; some of these inputs he provides himself and some of these he purchases from the market (see the following chart).

Notes

Chart Showing the Cost Elements for a Farmer

Total Cost of Production (Rice)

Explicit cost	**Cost of self provided inputs or (implicit cost)**	**Normal Profit**
1. Fertilizers	1. His own land	The minimum remuneration which must be earned by the farmer in order to induce him to produce this crop instead of switching over to the production of any other product
2. Insecticides	2. His own well, the water of which he uses for irrigation	
3. Wages for agricultural workers who are employed for sowing and harvesting.	3. His own seeds saved from last crops	
4. Rent for tractor and harvestor	4. His and his family members' labour	
5. Payments of electricity used for pump set, tube-well etc.		

Notes

INTEXT QUESTIONS 18.1

1. Fill in the blanks using appropriate word from the choice given in brackets:

    (i) Paid out cost is .... (explicit cost, implicit cost).

    (ii) Normal profit .... a part of cost of production in micro economics (is, is not).

2. Some of the cost elements of a publisher are given below. Allocate them into explicit cost and implicit cost : (i) his own labour (ii) expenditure on papers, ink, electricity etc. (iii) expenditure on printing machine (iv) insurance premium (v) payments of wages and salaries to workers (vi) his own building where he prints the books and (vii) expenditure on transport to bring raw material like papers, ink etc.

18.4 PRIVATE AND SOCIAL COSTS

(a) Private Costs

While producing a commodity a firm has to pay for raw material; it has to pay wages of workers; it has to pay rent of building. These are private costs for the firms. Thus private costs are the expenditure of an individual firm in producing a commodity.

(b) Social Costs

Factories emit large amount of smoke from their chimneys into the atmosphere. This may not figure in the calculation of costs in their records. But the cost to the community may be in the form of additional washing bills for clothes and the money spent by the community on medical bills etc. These costs are social costs.

18.5 MONEY COST VS REAL COST

The explicit cost and the private cost referred above are actually incurred by the producer in money terms. So, they are also called money cost. Wage to labour, rent for building, interest on borrowed funds etc. are paid in monetary units and hence called money cost.

Real cost, on the otherhand, has no definite money value nor it can be measured in monetary terms. A producer makes a lots of sacrifices and toils hard to set up business. The pain, discomfort, stress and strain that he/she undergoes cannot be measured in money. This is called real cost to the producer. The sacrifice, discomfort, disutility, toils and efforts involved in supplying factors of production by their owners make real cost of production.

18.6 NATURE OF COST IN PRODUCTION PROCESS

You have already studied that production process, in the short run, involves fixed and variable factors whereas in the long run all factors are variable. Accordingly, cost of production is calculated depending on whether production is taking place in short run or in the long run.

Cost in the short run: Fixed vs variable cost : In the short run two types of factors are identified. One, fixed factors which cannot be changed and two, variable factors which can be changed to increase output. Fixed costs are those costs which do not change with any changes in the quantity of production or size of output during period. They remain constant during the whole period at any level of output. Whether the production is zero or less or more. Then cost are fixed in nature. Fixed costs are also known as supplementary cost. Let the rent of a factory building paid by the producer is ₹ 1000 per month. Whether the producer produces the output or not, he/she has to pay the rent after hiring the building.

On the other hand variable cost are those cost which vary with the change in the quantity of output or production. They do not remain constant and are variable in nature. There cost increase with increase in output and decrease with a decrease in output. These costs are related to variable factor of production. They are also known as direct cost or prime cost. For example, labour is called variable factor in the short run. So, wage paid to labour is a variable cost. In order to increase output, producer can hire more units of labour. So, the expenditure on wages will increase. If output level is to be reduced, then producer can reduce the amount of labour and accordingly less amount of wage will be paid. So variable cost varies with change in level of output.

18.7 CALCULATION OF FIXED AND VARIABLE COST

TFC   Total expenditure on fixed factors is called total fixed cost (TFC)

TVC   Total expenditure on variable factors is called total variable cost (TVC)

TC   Sum of TFC and TVC is the total cost (TC)

TC = TFC + TVC

(c) Illustration

The concepts of fixed costs and variable costs can be understood better with the help of a schedule and an illustration. Suppose, a firm producing pens incurs the following costs at different levels of output (as given in Table 18.1): You will see that its fixed cost remains constant whereas variable cost changes with every change in level of output. In this schedule, the fixed cost is ₹ 60 and remains the

same at all levels of output. The variable cost is ₹ 60 when the producer is producing 100 pens. It rises to ₹ 100 when he produces 200 pens and to ₹ 150 when he produces 300 pens and so on.

Table 18.1 : Cost Schedule of a Firm

No. of pens in units (1 unit = 100 pens)	Total fixed cost (₹)	Total variable cost (₹)
0	60	0
1	60	60
2	60	100
3	60	150
4	60	260
5	60	390

INTEXT QUESTIONS 18.2

State whether the following statements are true or false:

(i) With increase in the quantity of output fixed costs increase.

(ii) There are no variable costs at zero output

(iii) Expenses incurred on watchmen and property tax are fixed cost.

(iv) Variable costs change with every change in output.

(v) Cost incurred on all the labour is variable.

18.8 CALCULATION OF COST

Total cost of a given volume of output is the sum of the explicit and implicit costs and normal profit. In the previous section we have learnt that production costs are classified into fixed cost and variable cost.

These two costs together make total cost

 i.e.,   TC = TFC + TVC

where TC stands for total cost, TFC for total fixed cost and TVC for total variable cost.

When a production unit is established but there is no production, total cost is the same as the total fixed cost. As production takes place, variable cost is also incurred and so total cost changes. Total cost increases as the quantity of output

rises, The change in total cost equals the change in total variable cost. This is because total fixed cost remains constant at all quantities of output. Change in total cost is due to changes in variable cost only. The calculation of total cost can be explained through the following example :

Table 18.2 : Cost Schedule of a Pen Producer

No. of pens in units (one unit = 100 pens)	TFC (₹)	TVC (₹)	TC (TFC+TVC) (₹)
0	60	0	60
1	60	60	120
2	60	100	160
3	60	150	210
4	60	260	320
5	60 .	390	450
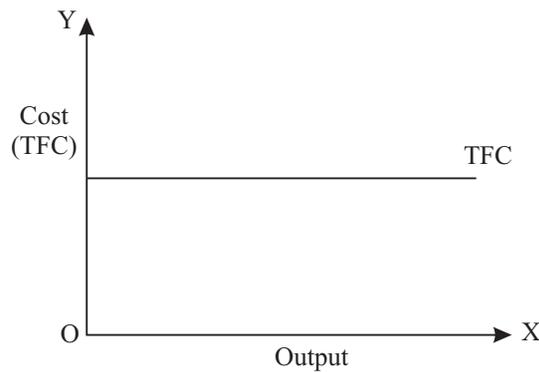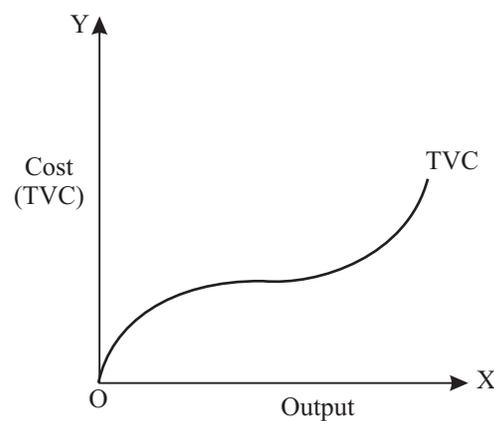
Fig. 18.1

Fig. 18.2

Notes
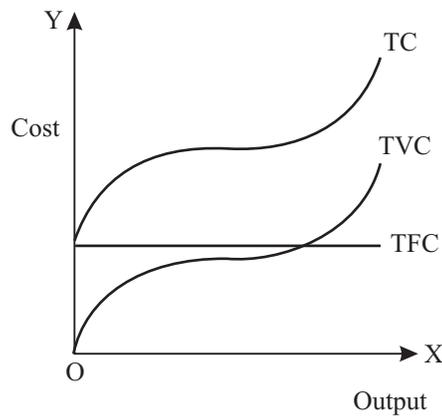
Fig. 18.3

The Table 18.2 shows that total fixed cost is ₹ 60 and remains the same at all quantities of output. The variable cost equals ₹ 60 when one unit is produced, increases to ₹ 100 at 2 units and to ₹ 150 at 3 units and so on. As the total cost is the sum of total fixed cost and total variable cost, it can be obtained by adding them at various quantities of output. For example, when one unit is produced total cost is ₹ 120 (₹ 60 + ₹ 60) and when two units are produced, it works out to be ₹ 160 (₹ 60 + ₹ 100). Thus, we find that total cost varies directly with the level of output.

INTEXT QUESTIONS 18.3

Fill ill the blanks with appropriate words given in the brackets:

(i) Changes in total cost when output varies are due to changes in .... (fixed cost, variable cost).

(ii) To find total cost we have to .... total fixed cost and total variable cost (add, multiply)

(iii) Total cost .... zero at zero output (is, is not).

(iv) When output is zero total cost equals ....(fixed cost, variable cost).

18.9 AVERAGE COST

In this section, we will discuss the concepts of average fixed cost (AFC), average variable cost (AVC) and average total cost (ATC). We make the following schedule showing calculations of these costs:

Table 18.3 : Cost Schedule of a Pen Producer

Output of pens(l unit = 100 pens)	TFC (₹)	TVC (₹)	TC (TFC+TVC) (₹)	AFC ₹	AVC ₹	ATC (AFC+AVC) (₹)
0	60	0	60	-	-	-
1	60	60	120	60	60	120
2	60	100	160	30	50	80
3	60	150.	210	20	50	70
4	60	260	320	15	65	80
5	60	390	450	12	78	90

(a) Average Fixed Cost (AFC) :

Average fixed cost is obtained by dividing total fixed cost by the number of units of output produced.

$$AFC = \frac{TFC}{Units\ of\ output}$$
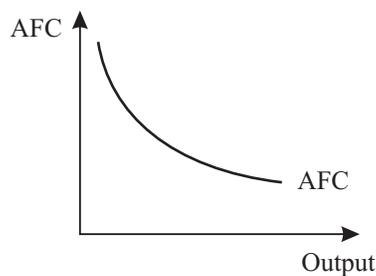
Fig. 18.4

Thus, Average Fixed Cost is per unit fixed cost in producing a commodity or fixed cost per unit of output.

Fixed cost by definition remains fixed whatever is the level of output. Therefore, as production expands the total fixed cost is distributed over a larger numbers of units. As a result average fixed cost falls with every increase in output. For example, the total fixed cost of our producer is ₹ 60 when he produces one unit. Average fixed cost is ₹ 60 (₹ 60 ÷ 1) But if the production is increased to 2 units, average fixed cost is ₹ 30 (₹ 60 ÷ 2). When he produces 3 units it is ₹ 20 (₹ 60 ÷ 3). Therefore, the larger the output the lower will be the average fixed cost.

(b) Average Variable Cost (AVC)

Average variable cost is obtained by dividing the total variable cost by the units of output produced.

$$AVC = \frac{TVC}{Units\ of\ output}$$
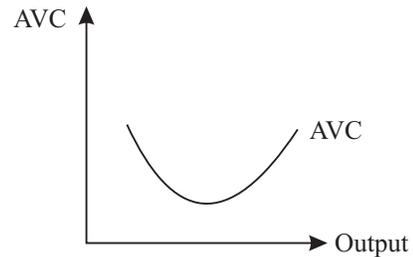
Fig. 18.5

Thus, average variable cost is per unit variable cost in producing a commodity or variable cost per unit of output.

When output of pens is one unit TVC is ₹ 60, so AVC will be ₹ 60 (₹ 60 ÷ 1). TVC at 2 units of pens is ₹ 100. So AVC at 2 units of output of pens is ₹ 50 (₹ 100 ÷ 2) and so on.

(c) Average Total Cost (ATC) :

ATC is obtained by dividing the Total Cost (TC) by the total units of output:

$$ATC = \frac{TC}{Units\ of\ output}$$
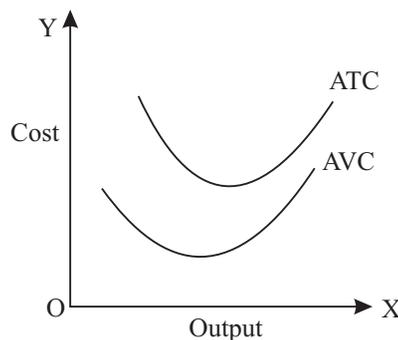
Fig. 18.6

Thus, total cost is the per unit total cost in producing a commodity or cost per unit of output.

The total cost of producing one unit of pen is ₹ 120. Therefore, ATC is ₹ 120 (₹ 120 ÷ 1).

Total cost of 2 units of output is ₹ 160. So ATC is ₹ 80 (₹ 160 ÷ 2). As total cost is the sum of TFC and TVC, average total cost is the sum of AFC and AVC. So we can also find out ATC by adding AFC and AVC :

ATC = AFC + AVC

$$\frac{TC}{\text{Units of output}} = \frac{TFC}{\text{Units of output}} + \frac{TVC}{\text{Units of output}}$$

Check up from the schedule that ATC can also be calculated in this manner.

Notes

INTEXT QUESTIONS 18.4

Fill in the blanks with appropriate words given in the brackets:

(i) Average cost is .... (cost per unit, cost incurred on additional unit).

(ii) To find total cost we have to .... average cost by quantity of output (multiply, divide).

(iii) Average fixed cost .... with the increase in output (falls, rises).

(iv) Average total cost is the sum of .... and ....

(average fixed cost, average variable cost, variable cost, fixed cost).

18.10 MARGINAL COST

The concept of marginal cost is a very important concept in micro economics. The importance of this concept will be more clear to you when you read lesson No. 20 on 'Maximisation of Profits'. The word marginal should be taken to mean additional. For example, Marginal cost of producing a level of output is the addition to the total cost or total variable cost caused by producing an extra unit of output.

$$MC_N = TC_N - TC_{N-1}$$

or $$MC_N = TVC_N - TVC_{N-1}$$

To explain how it is calculated, look at the following Table.

Table 18.4

Output of pens (1 unit = 100 pens)	Total cost (₹)	Marginal cost (₹)
0	60	–
1	120	60
2	160	40
3	210	50
4	320	110
5	450	130
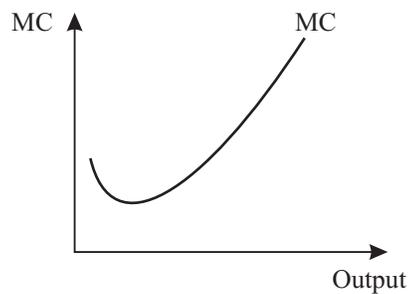
Fig. 18.7

When output level is zero, total cost is ₹ 60. As one unit of pen is produced by the producer the total cost rises to ₹ 120. So the marginal cost of producing one unit of output is ₹ 60 (₹ 120-₹ 60). When it produces 2 units his total cost increases to ₹ 160; the marginal cost at 2 units of output is ₹ 40 (₹ 160-₹ 120). This has been calculated by deducting total cost of 1 unit from total cost of 2 units. Marginal cost at one unit of output is ₹ 60. This we got by deducting total cost of zero unit from total cost of one unit.

It should be kept in mind that marginal cost is dependent on the variable cost only. It is not affected by fixed cost because fixed cost remains constant. As output expands, changes in total cost are due to changes in variable cost only. So, marginal cost can also be calculated if only total variable costs are known to us. For example, take the following Table 18.5 showing TFC, TVC and TC. When we calculate MC from either TC or TVC we get the same result. Calculate yourself and the check the result.

Table 18.5

Output of pens (1 unit = 100 pens)	Total cost (₹)	TFC (₹)	TVC (₹)	MC (₹)
0	60	60	0	–
1	120	60	60	60
2	160	60	100	40
3	210	60	150	50
4	320	60	260	110
5	450	60	390	130

 INTEXT QUESTIONS 18.5

Fill in the blanks:

(i)   Marginal cost is the .... cost incurred on additional unit of output.

(ii) Marginal cost equals the change in total cost or the change in .... per unit change in output.

(iii) Output increases from 3 units to 4 units. As a result TC rises from ₹ 19.60 to ₹ 24.50. MC is ....

18.11 RELATIONSHIP BETWEEN AC, AVC AND MC

The relationship between AC, AVC and MC can be illustrated with the help of the table 18.6 and diagram 18.8.

Output (Units)	TVC (₹)	AVC (₹)	MC (₹)
0	0	–	–
1	6	6	6
2	10	5	4
3	15	5	5
4	24	6	9
5	35	7	11
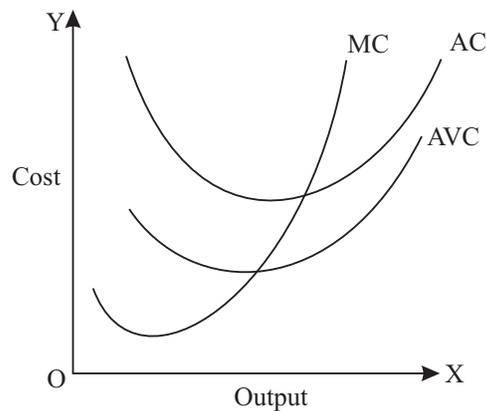
Fig. 18.8

(a) Relationship between AC and MC

(i)   When MC is less than AC, AC falls with increase in the output

(ii) When MC becomes equal to AC, AC becomes minimum and constant.

(iii) When MC is more than AC, AC rises with increase in the output.

(b) Relationship between AVC and MC

(i)   When MC is less than AVC, AVC falls with increase in the output

(ii)   When MC becomes equal to AVC, AVC becomes minimum and constant.

(iii) When MC is more than AVC, AVC rises with increases in the output

WHAT YOU HAVE LEARNT

- In Micro Economics, cost is the sum of (a) explicit cost (b) implicit cost and (c) normal profit. It is different from cost used in business which includes only explicit cost.

- Explicit cost is the cost of inputs hired and purchased from the market. It is also called money cost.

- Implicit cost is the cost of the inputs which are owned and supplied by the entrepreneur himself in the production of a commodity. It is equal to the opportunity cost of these inputs.

- Normal profit is the minimum supply price of the entrepreneur which he must get in order to remain in the present business.

- Private cost is the cost which a firm has to incur in the production of a commodity.

- Social cost is the cost to the society as a whole for producing a commodity in the form of air-pollution, water-pollution and noise pollution etc.

- Fixed costs are the costs which do not change with change in the level of output.

- Variable costs are the costs that directly vary with changes in the level of output.

- Total cost is the sum of Total Fixed Cost (TFC) and Total Variable Cost (TVC).

- Average Fixed Cost is the per unit fixed cost of the output produced. It goes on decreasing with increase in output.

- Average Variable Cost (AVC) is the per unit variable cost of output produced.

- Average Total Cost (ATC) is the sum of the AFC as AVC.

- Marginal Cost (MC) is the addition to TC/TVC by the production of an additional unit of the product.

TERMINAL EXERCISE

1. What is implicit cost? How is it different from explicit cost?

2. What is explicit cost? Distinguish it from implicit cost.

3. Explain the concept of 'normal profit'. Justify that it is an element of cost in micro economics.

4. Explain the various elements of cost in micro economics.

5. Differentiate between the concepts of cost as used in business and in micro economics.

6. Distinguish between fixed cost and variable cost with suitable examples.

7. Explain the relationship between output and average fixed cost.

8. Distinguish between AFC and AVC and describe how these are calculated.

9. Explain the term 'marginal cost'. Show with the help of an example how is it calculated.

10. Which cost, fixed or variable, determines marginal cost? Give reasons.

11. Classify the following expenditure into explicit cost and implicit cost:

    (a) A farmer growing seeds and using them for cultivation

    (b) Use of chemical fertilizers by a farmer.

    (c) Use of the services of a tractor owned by the farmer

    (d) Farming by the farmer who owns the land

    (e) Unpaid family labour used on farms

    (f) Transport charges

    (g) Interest on borrowings

    (h) Wages paid

    (i) Use of own building for production

    (j) Excise duty.

12. Classify the following expenditure into fixed cost and variable cost :

    (a) Rent of the factory building

    (b) Wages to watchman

    (c) Annual licensing fee of factory premises

    (d) Raw material

    (e) Rent of the agricultural land

Notes

Notes

(f)   Seeds

(g)   Fertilizers

(h)   Interest on borrowings

(i)   Excise duty

(j)   Transport charges.

13. Calculate total cost, average total cost, average fixed cost, average variable cost and marginal cost on the basis of the following information:

Output (units)	TFC	TVC
0	60	0
1	60	50
2	60	90
3	60	180
4	60	300

14. Calculate (i) TFC and TVC (ii) AFC and AVC and (iii) MC from the following data :

Output (units)	TC
0	180
1	300
2	400
3	510
4	720
5	1000

15. Suppose that TFC is ₹ 120, find out

TC, TVC and MC from the following data :

Output (units)	ATC (₹)
1	240
2	160
3	~140
4	160
5	180

16. Fill in the blanks :

Output (units)	TC	TFC	TVC	MC
0	12	-	-	-
1	20	-	-	-
2	24	-	-	-
3	30	-	-	-
4	44	-	-	-

Notes

17. Complete the following table :

Output (units)	Total fixed cost	Total cost	ATC	Marginal cost	AFC
0	8			–	8
1				12	
2				10	
3				8	
4				6	
5				5	

ANSWERS TO INTEXT QUESTIONS

18.1

1. (i) explicit cost

   (ii) is

2. Explicit cost: (ii) (iii) (iv) (v) and (vii)

   Implicit cost: (i) and (vi)

18.2

(i) False (ii) True (iii) True (iv) True (v) False

18.3

(i) variable cost (ii) add (iii) is not (iv) fixed cost

18.4

(i) cost per unit (ii) multiply (iii) falls (iv) average fixed cost, average variable cost

18.5

(i) additional (ii) Total variable cost (iii) ₹ 4.90

Terminal Exercise

1. Read section 18.3 (b)
2. Read section 18.3 (a)
3. Read section 18.3 (c)
4. Read section 18.3
5. Read section 18.3
6. Read section 18.5
7. Read section 18.7 (a)
8. Read section 18.7 (a, b)
9. Read section 18.8
10. Read section 18.8
11. Explicit costs : b, f, g, h, j

    Implicit costs : a, c, d, e, i
12. Fixed cost: a, b, c, e, h

    Variable cost: d, f, g, i, j
13.

Total Cost (₹) TFC+TVC	AFC	AVC	ATC	MC
60	-	-	-	-
110	60	50	110	50
150	30	45	75	40
240	20	60	80	90
360	15	75	90	120

Notes

14.

Output (units)	TC ₹	TFC ₹	TVC ₹	AFC ₹	AVC ₹	MC ₹
0	180	180	0	-	-	-
1	300	180	120	180	120	120
2	400	180	220	90	110	100
3	510	180	330	60	110	110
4	720	180	540	45	135	210
5	1000	180	820	36	164	280

15.

Output (units)	ATC	TC	TFC	TVC	MC
1	240	240	120	120	120
2	160	320	120	200	80
3	140	420	120	300	100
4	160	640	120	520	220
5	180	900	120	780	260

16.

Output (units)	TC ₹	TFC ₹	TVC ₹	MC ₹
0	12	12	0	-
1	20	12	8	8
2	24	12	12	4
3	30	12	18	6
4	44	12	32	14

17.

Output (units)	Total fixed cost	Total cost	Marginal cost	ATC	AFC
0	8	8	-	-	-
1	8	20	12	20	8
2	8	30	10	15	4
3	8	38	8	12.66	2.66
4	8	44	6	11.00	2.00
5	8	49	5	9.80	1.60

Notes

19

SUPPLY

We have already studied about the meaning of demand, factors determining demand and the law of demand etc. the demand for the commodities comes from the buyers of the commodities. But the buyers can purchase a commodity only when it is available in the market. The firms produce goods and services which are demanded by the households for the satisfaction of their wants. Firms have to incur some expenditure on the purchase of inputs required for producing the goods and services. They get revenue by selling these goods and services. In this process, the firms have an objective of earning maximum profit. The focus of this chapter is to understand why a firm or a seller is willing to sell its product in the market. We assume that there are no intermediaries in the market, so the firm is also the seller of the commodity.

OBJECTIVES

After completing this lesson, you will be able to:

- define supply;
- discuss the factors that affect the supply;
- know the meaning of supply function;
- prepare a supply schedules from supply function;
- state and explain the law of supply;
- differentiate between individual and market supply;
- prepare and individual and market supply schedule;
- draw an individual and market supply curves;
- distinguish between change in supply and change in quantity supplied; and
- differentiate between movement along a supply curve and shift of supply curve.

19.1 MEANING OF SUPPLY

supply a commodity by a firm or seller **may be defined as the quantity of a commodity that a firm or seller offers for sale at a given price during a given time period.** But the actual sale of the commodity may be different from its supply. For example a farmer (produced of wheat) is willing to sell 50 quintals of wheat at a price of ₹ 15 per kg but he is able to sell only 30 quintals at this price. So this case the supply of wheat is 50 quintals but the actual sale is 30 quintals. So these two concepts should not be confused with each other. Like demand supply also has three elements. The definition of supply include (i) the quantity of the commodity that a firm is willing to supply (ii) the price at which it is willing to supply that quantity and (iii) the time period during which it is willing to supply that quantity.

Notes

19.2 FACTORS DETERMINING SUPPLY OR DETER-MINANTS OF SUPPLY OF A GOOD

The main determinant of supply is the price of the commodity. But the cost of production of a commodity is an important factor in determining profit maximized on output of a firm. The cost of production depends on the prices of various inputs, like raw material, wages of workers, interest of capital, rent of building etc. The supply of a commodity also depends on the technology used in the production of the commodity and many other factors. The main factors determining supply of a commodity are

(i)   Price of the commodity

(ii) Price of other related good

(iii) Price of inputs/factors

(iv) Taxation policy of government

(v)   Objective of the firm

(i)   **Price of the commodity:** Other factors determining supply remaining constant, there is a direct relationship between price and quantity supplied of a commodity. It means the quantity supplied of a commodity increases with rise in price and decreases with fall in price of the commodity. More quantity of a commodity is supplied at a higher price and less quantity is supplied at a lower price. For example a seller of tomatoes is willing to sell 100 kgs of tomatoes at a price of ₹ 40 per keg and only 50 kgs at a price of ₹ 20 per kg. Due to this direct relationship between price and quantity supplied of a commodity the supply curve has a positive slope. Supply curve is upward sloping to the right.

(ii) **Price of other related goods:** Supply of a commodity is also influenced by the change in the price of other related goods. With the help of given resources

we can produce several goods by using the same technology. This helps the firm to diversify and tide over fluctuations in demand. For example, a farmer can produce either pulses or food grains by using the resources. If the price of pulses increases it becomes more profitable for him to make more production of pulses. So he will divert some resources from the production of food grains to the production of pulses. The production of pulses will increase and that of food grains will decrease. So the supply of pulses will increase if the price of pulses increases and the supply of food grain will decrease at the same price reverse will happen if the price of food grains increases.

(iii) **Price of inputs/factors:** Change in the price of inputs like raw material, wage, rent or interest also influences the supply of a commodity. For example, in the production of cloth, cotton is the main raw material. If the price of cotton increases, the cost of production of cloth will increase. At the same price, the margin of profit will decrease. So the producer will decrease the supply of cloth at the same price. On the other hand if the price of cotton falls, the cost of production per unit of cloth will decrease and hence the supply of cloth will increase. The price of other inputs will also influence the supply of a good in the same manner.

(iv) **Technology of production:** an improvement in the technology of production of a commodity decreases the per unit cost of the commodity. The margin of profit will increase at the same price. So the supply of a commodity will increase, with improvement in technology of production, at the same price. On the other hand if a firm uses absolute technology of production, the cost of production per unit of the commodity will increase. The margin of profit will decrease, so the firm will decrease its supply at the same price. This is the main reason that the firms are trying to use better technology of production because it not only reduces the cost of production per unit but also improves the quality of the product.

(v) **Taxation policy of government:** If the government reduces the excise duty or the production of a commodity, the cost of production per unit of the commodity will decrease, the margin of profit will increase at the same price so the producer of the commodity will increase its supply. It happens when the government wants to increase the production of the commodity. On the other hand to discourage the production of some harmful goods, like cigarettes, liquor etc, the government increases the rate of excise duty on the production of such goods. So the cost of production per unit of the commodity increases and the supply of such commodities decreases.

(vi) **Objective of the firm:** The objective of the producer also influences the supply of a commodity. Generally, the objective of a producer is get maximize his profits. Profits are maximized at a higher price. So he increases the supply

of a commodity at a higher price and decreases its supply at a lower price. But sometimes, the producer may be in maximizing his sales and not in maximizing his profits as he wants to capture the market. In that case, he goes on increasing the supply so long his target is not achieved can profit is not adversely affected. He may increase the supply at the same price to any extent.

INTEXT QUESTIONS 19.1

1. Define supply.

2. What is the meaning supply?

3. State any three determinants of supply.

4. How does technological progress influence the supply of a commodity?

5. What is the effect of change in price of inputs on the supply of a commodity?

6. How does change in the price of other related goods affect the supply of a commodity?

19.3 SUPPLY FUNCTION

When the relationship between quantity supplied and the determinants of supplied is expressed mathematically in an equation, it is called a supply function. So a supply function can be expressed as:

$$S_n = f(P_n, P_r, P_f, T, T_r, G)$$

where S_n = Supply of commodity n

P_n = Price of the commodity n

P_r = Price of other related goods

P_f = Price of inputs/factors

T = Technology of production

T_r = Government policy or tax rate

G = Goal or objective of the producer

Typically supply function shows the relationship between price and quantity supplied, keeping all other determinants of supply as constant. It shows the amount of a good that a seller supplies at different levels of price.

For example, a supply function can be

$$qs = -15 + 3P$$

Notes

In the above equation quantity supplied qs is a function of price P. The sign before p is always positive which indicates that the price and quantity supplied are directly related and the supply curve is upward sloping to the right. Here +3 means that the every unit increase in price there is an increase of 3 units in supply. –15 in the supply function represents the point at which the supply cur e cuts x-axis.

We can derive a supply schedule with the help of supply function.

Table 19.1: Supply schedule of commodity x

Price of unit (₹)	Quantity supplied per unit of time (units)
5	0
6	3
7	6
8	9
9	12

The above table shows that for the price levels more that ₹ 5, there is a positive quantity supplied. But for ₹ 5, or less than ₹ 5, the supply of commodity x is zero because supply can not be negative.

19.4 LAW OF SUPPLY

The law of supply depicts the relationship between price and quantity supplied of a commodity when all other determinants of supply remain constant. This law states that there is a direct relationship between price and quantity supplied of a commodity, other factors determining supply remaining constant. It means quantity supplied of a commodity increases with increase in price and decreases with decrease in price.

19.4.1 Assumptions of the law of supply

The phrase other determinants of supply remaining constant in the law of supply shows the assumptions of the law of supply. The mains factors which influence the supply of a commodity one, price of the commodity, price of other related goods, price of inputs, technology of production, taxation policy of the government and objective of the firm etc. The law of supply is based on the assumptions that all these factors determining supply except price of the commodity should remain constant. The following are the main assumptions of the law of supply.

(i)   Price of other related goods should remain the same

(ii) There should be no change in the price of inputs (factors)

(iii) Technology of production should not change.

(iv) There is no change in the taxation policy of the government.

(v) Objective of the firm should not change

The law of supply is based on the assumptions that the supply of commodity changes only due to change in price when all other determinant of supply remain constant.

Notes

19.4.2 Individual and Market Supply

Individual Supply

Individual supply refers to the quantity of a commodity which an individual firm is willing to sell at a given price during a given period of time. It is related with the supply of an individual firm.

Market Supply

Market supply is the collective supply of all the firms in the market of a commodity at a given price during a given period of time. Market supply tells us the told availability of a commodity which can be used to meet the total element of the commodity. **Market supply can be desired by summing up the supply of all the individual firms in the market.**

19.4.3 Supply Schedule

Supply schedule is a table showing different quantities of a commodity that a firm is willing to sell at different prices during a given period of time. Supply schedule can be of two types.

(i) *Individual supply schedule:* When we represent a single firm, willingness to sell different quantities of a commodity at different prices during a given time period, we get individual supply schedule.

(ii) *Market supply schedule:* **Market supply schedule is constructed by summing up the supplies of all the individual firm at different prices during a given period of time.** A market supply schedule is a table showing the total supply of a good by all the firms at different price during a given time period . Market supply schedule can be explained with the help of the following table.

Notes

Market supply schedule for sugar

Price per kg (₹)	Quantity supplied of sugar by firm A (kgs)	Quantity supplied by firm B (kgs)	Quantity supplied by firm C (kgs)	Market supply A + B + C (kg)
25	100	200	0	300
30	200	300	100	600
35	300	400	200	900
40	400	500	300	1200
45	500	600	400	1500

In the above table we see that at a price of ₹ 25 per kg the firms A, B and C willing to sell 100, 200 and 0 kgs of sugar respectively. So the market supply as ₹ 25 is 100 + 200 + 0 = 300 kgs of sugar. In the same way the market supply has been calculated at other prices also. The market supply is influenced by the number of firms in the market.

19.4.4 Supply Curve

Supply curve is the graphical presentation of a supply schedule. It shows the quantity that all the firms in the market are willing to supply at a given price during a given time period when all other factors influencing supply remain constant. Supply curve is also of two types.

(i) **Individual supply curve:** Graphical presentation of individual supply schedule is called individual supply curve. It shows the different quantities of a commodity, an individual firm is willing to sell at different prices during a given time period.

(ii) **Market supply curve: Market supply can be derived by horizontal summation of all individual supply curve:** It show the different quantities of a commodity that all the firms are willing to sell at different prices during a given time period.

Let us assume that these are only 3 firms supplying sugar in the market. The supply curves of these firms are represented by SA, SB and SC respectively. If a t ₹ 30 per kg each firm is willing to sell 200, 300 and 100 kgs of sugar respectively. The market supply at ₹ 30 per kg is the sum of a the supply of the three firms 200 + 300 +100 = 600 kgs of sugar. This gives us one point A on the market supply curve as shown in the figure given below.

Fig. 19.1

Notes
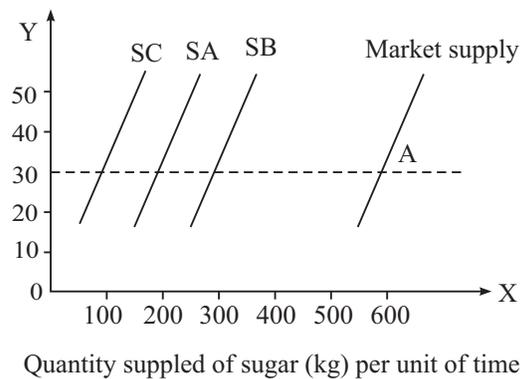
INTEXT QUESTIONS 19.3

(i)   State the law of supply.

(ii) Define market supply.

(iii) What is supply schedule?

(iv) How is market supply schedule deviated from individual supply schedule?

(v)   What is supply curve?

(vi) How is market supply curve derived from individual supply curves?

(vii) Explain the law of supply with the help of a schedule and a diagram.

19.5 FACTORS DETERMINING SUPPLY

All the factors determining supply of a commodity can be classified into two parts.

(i)   Price of the commodity

(ii) Other factors determining supply

This classification is based on the fact that the law of supply or the supply curve shows the relationship between price and quantity supplied of a commodity when all other determinants of supply remain constant.

(i)   **Price of the commodity:** In the law of supply we have studied that the quantity supplied of a commodity increases with increase in priced and decrease with decrease in price all other determinants of supply remaining constant. These increase and decrease in supply are also termed as expansion and contraction of supply respectively. Expansion of supply is shown through

Notes

an upward movement along the same supply curve on the other hand contraction of supply is shown through downward movement on the same supply curve.

Movement along the supply curve or expansion and contraction of supply can be explained with the help of the following diagram.

In the above figure initial price and quantity supplied are OP and OQ respectively. When the price increased from OP to OP1, the quantity supplied increases from OQ to OQ1. This is shown by upward movement from point A to point B on the same supply curve. This upward movement of the same supply curve shows the expansion of supply.

On the other hand wen the price falls from OP to OP2, the quantity supplied decreases from OQ to OQ2. This is shown by downward movement from point A to point C on the same supply curve. This downward movement on the same supply curve shows the contraction of supply.
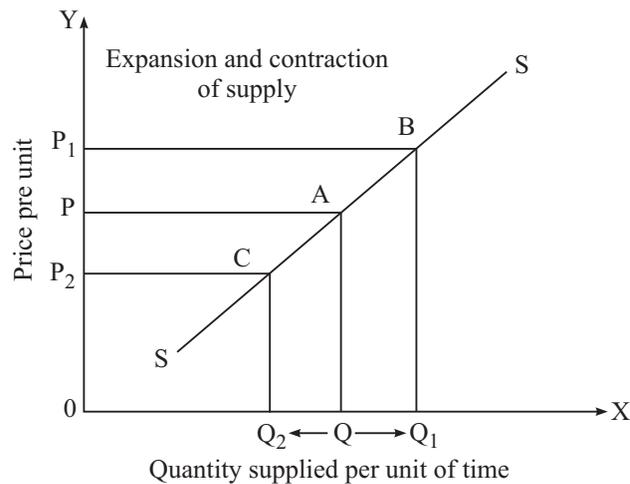
Fig. 19.2

We can say that change in price of the commodity leads to change in quantity supplied of the commodity. It is shown by movement on the same supply curve. Increase in quantity supplied reflects expansion of supply and decrease in quantity supplied reflects contraction of supply.

(ii) **Other factors determining supply:** But if there is change in factors other than the price of the commodity, then either more is supplied at the same price or less supplied at the same price. In such cases, the price of the commodity remains constant but there is a change in other factors like change in the price

of inputs, change in technology of production, change in price of other related goods, change in taxation policy of the government etc.

For example, there is an improvement in the technology of production of the commodity in question. It leads to decrease in per unit of cost production of the commodity. The firm is willing to sell more quantity of the commodity at the same price. So the supply other commodity increases at the same price. This increase in supply is shown by rightward shift of supply curve.

On the other hand if the firm uses inferior technology of production, the cost of production per unit of the commodity increases. The firm is willing to sell less quantity at the same price. So the supply of the commodity decreases at the same price. This decrease in supply is shown by leftward shift of the supply curve.

The above cases of increase and decrease in supply can be shown with the help of the following figures.
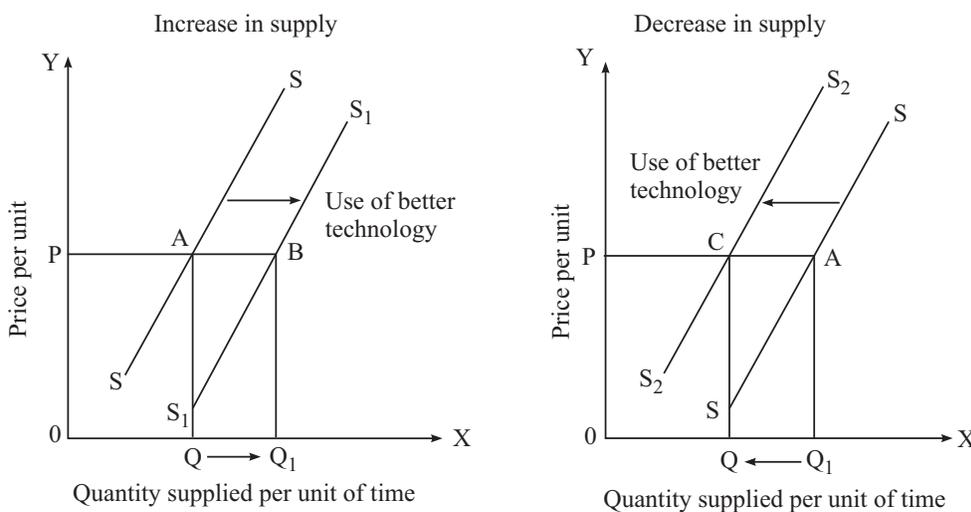
Fig. 19.3

19.5.1 Main factors causing increase in supply or rightward shift of supply Curve

(i) Fall in the price of other related goods

(ii) Fall in the price of inptus/factors

(iii) use of better technology in production

(iv) Decrease in the rate of excise duty by government

(v) If the objective of producer changes from profit maximization to sales maximization

19.5.2 Main factors causing decrease in supply or leftward shift of supply curve

(i) Increase in the price of other related goods

(ii) Rise in the price of inputs/factors

(iii) use of inferior technology in production

(iv) Increase in the rate of excise duty by the government

(v) If the objective of the producer changes from soles maximization to profit maximization.

INTEXT QUESTIONS 19.4

(i) If the quantity supplied of a commodity falls only due to rise in its price, what is that fall is supply called?

(ii) If the supply of a commodity rises due to improvement in technology, what is that rise in supply called?

(iii) State any three factors causing increase in supply of a commodity.

(iv) State any three factors causing decrease in supply of a commodity.

(v) State any three factors causing rightward shift of supply curve.

(vi) State any three factors causing leftward shift of supply curve.

(vii) Distinguish between expansion in supply and increase in supply.

(viii) Distinguish between decrease in supply and contraction in supply

(ix) Distinguish between movement along the same supply curve and shift of supply curve.

(x) Distinguish between change in quantity supplied and change in supply.

WHAT YOU HAVE LEARNT

● Supply of a commodity refers to the quantity of a commodity that a seller is willing to sell at a given price during a specific period of time.

● Supply of a commodity is influenced by the factors (i) price of the commodity (ii) price of other related good (iii) Price of inputs/factor (iv) Technology of production (v) Taxation policy of the government (vi) Objective of the firm

● When the relationship between quantity supplied and determinants of supply is represented in a mathematical equation, it is called a supply function.

- The law of supply states that other factors determining supply remaining constant, there is a direct relationship between price and quantity supplied of a commodity.

- Supply schedule is a table which shows the different quantities of a commodity supplied at different prices.

- Supply curve is graphical presentation of supply schedule.

- Market supply schedule can be obtained by summing up all individual supply schedules.

- Market supply curve can be obtained by horizontal summation of all individual supply curves.

- Change in quantity supplied takes place only due to change in the price of the commodity.

- Change in supply takes place due to change in factors other than the price of the commodity.

- Increase in supply leads to rightward shift of supply curve and decrease in supply leads to leftward shift supply curve.

- Expansion of supply leads to upward movement and contraction of supply leads to downward movement on the same supply curve.

Notes

TERMINAL EXERCISE

1. Give the meaning of the term supply.

2. Explain in brief the various determinants of supply.

3. Define supply function.

4. Explain the law of supply and point out the main assumptions behind this law.

5. Distinguish between a supply schedule and a supply curve.

6. How is market supply curve derived from individual supply curves?

7. State the curves of increase in supply

8. How is it possible that a seller is ready to sell less quantity of commodity even at the same price.

9. Distinguish between movement along the supply curve and shift of supply curve.

10. Distinguish between decrease in supply and contraction of supply.

ANSWERS TO INTEXT QUESTIONS

19.1

1. Read section 19.1
2   Read section 19.1
3. Read section 19.2
4. Read section 19.2 (iv)
5. Read section 19.2 (iii)
6. Read section 19.2 (ii)

19.2

(i)   Price = 3
(ii)   Price = 8
(iii)   Quantity = 28

19.3

(i)   Read section 19.4
(ii)   Read section 19.4.2
(iii)   Read section 19.4.3
(iv)   Read section 19.4.3 (ii)
(v)   Read section 19.4.4
(vi)   Read section 19.4..4 (ii)
(vii)   Read section 19.4

19.4

(i)   Read section 19.5 (i)
(ii)   Read section 19.5 (ii)
(iii)   Read section 19.5.1
(iv)   Read section 19.5.2
(v)   Read section 19.5.1
(vi)   Read section 19.5.2
(vii)   Read section 19.5 (i) and 19.5 (ii)
(viii) Read section 19.5 (i) and 19.5 (ii)
(ix)   Read section 19.5 (i) and 19.5 (ii)
(x)   Read section 19.5 (i) and 19.5 (ii)

20

PRICE ELASTICITY OF SUPPLY

The law of supply tells us the direction of relationship between price and quantity supplied of a commodity. But it does not tell us about the quantum of change in supply due to a certian change in price of the commodity. For this purpose, we have to study the concept of elasticity of supply. This lesson will focus on concepts related with elasticity of supply. We will also learn how to measure price elasticity of supply.

OBJECTIVES

After completing this lesson, you will be able to:

● define price elasticity of supply;

● understand different degrees of price elasticity of supply;

● represent different degrees of price elasticity of supply;

● explain the percentage method of calculating price elasticity of supply;

● solve numerical example of price elasticity supply;

● understand the geometric method of calculating price elasticity of supply; and

● identify factors affecting price elasticity of supply.

20.1 MEANING OF PRICE ELASTICITY OF SUPPLY (e_s)

Price elasticity of supply measures the degree of responsiveness of quantity supplied of a commodity to change in its price. But the problem is that all the commodities do not respond in the same way to change in price. Some commodities are more responsive to change in price than others. For example, if the price of a commodity increases by 20 percent and it quantity supplied increase by 40 percent. In this case the supply of the commodity is very elastic because percentage in quantity supplied of the commodity is double the percentage change in its price.

Notes

We can explain it with the help of the following supply curves.
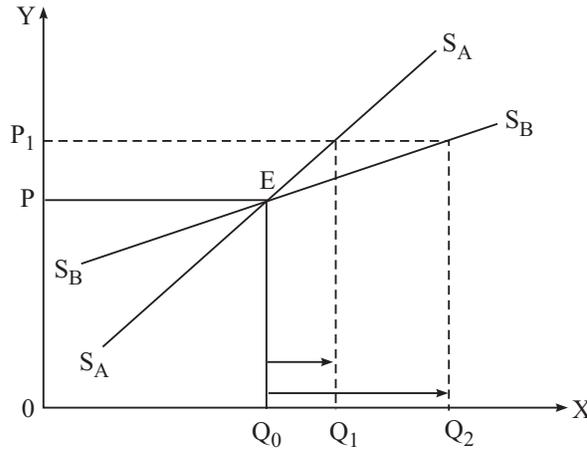
Fig. 20.1

In the above figure there are two commodities A and B′ supply curve for commodity A is represented by $S_A S_A$ and for commodity B by supply curve $S_B S_B$. At price OP the quantity supplied of both the commodities is OQ_0. But when the price increases to OP_1, the quantity supplied of commodity A in areas to OQ_1 and that of commodity B increased to OQ_2. The distance of OQ_0 to OQ_2 is greater than the distance of OQ_0 to OQ_1. So the increase in quantity supplied of commodity B is more than increase in quantity supplied of commodity A. So we can say that the price elasticity of supply of commodity B is more than the price elasticity of supply of commodity A. We can easily notice in the figure that the supply curve of commodity B is flatter than the supply curve of commodity A. So we can easily conclude that the elasticity of supply at flatter supply curve is more than a steeper supply curve.

$$e_s = \frac{\% \text{ change in } Q_X}{\% \text{ change in } P_X}$$

where Q_X = Quantity of good , P_X = Price of good x

20.2 DEGREES OF PRICE ELASTICITY OF SUPPLY

The co-efficient of price elasticity of supply varies from zero to infinity. On the basis of co-efficient of price elasticity of supply the following five degrees of price elasticity of supply are taken into consideration

(i)   Perfectly inelastic supply ($e_s = 0$)

(ii) Inelastic or less than unit elastic supply ($e_s < 1$)

(iii) Unitary elastic supply ($e_s = 1$)

(iv) Elastic or more than unit elastic supply ($e_s > 1$)

(v) Perfectly elastic supply ($e_s = \infty$)

The explanation of each is given below.

Notes

(i) Perfectly inelastic supply ($e_s = 0$)

Supply of a commodity is said to be perfectly inelastic when the quantity supplied of a commodity does not change at all in response to change in price of the commodity. It means that the price of the commodity may increase or decrease but its quantity supplied remained the same. In such cases the price elasticity of supply is zero and supply curve is a vertical line parallel to y-axis. It can be explained with the help of the following supply schedule and supply curve.

Supply schedule of eggs

| Price per dozen (₹)	Quantity supplied (in dozens)
10	50
20	50
30	50
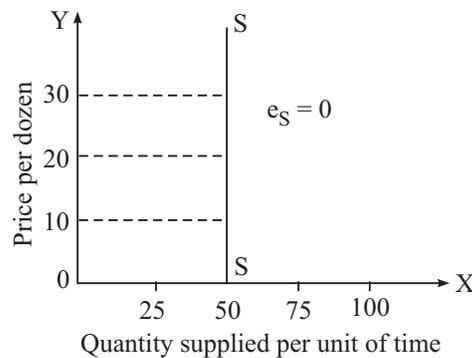
Fig. 20.2

In the above supply schedule and curve we see that the quantity supplied of the egg remains at 50 dozens whether the price is ₹ 10 or ₹ 20 or ₹ 30 per dozen.

(ii) Inelastic or less than unit elastic supply ($e_s < 1$)

When the percentage change in quantity supplied of a commodity is less than the percentage change in its price, the supply of the commodity is said to be inelastic or less than unit elastic. It happens generally in case of perishable goods as it is very difficult to store them. It is shown in the following supply schedule and supply curve.

Supply schedule of tomatoes

Price per kg (₹)	Quantity (Quintals)
20	100
40	150
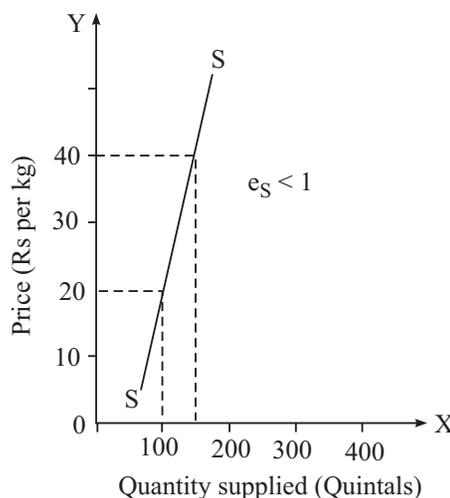
Fig. 20.3

In the above supply schedule the quantity supplied of the tomatoes has increased only 50 percent in response to 100 percent increase in its price. The supply curve if extended touches x-axis to the right of the origin. In such cases the supply curve has a steeps slope and price elasticity of supply is less than one but greater than zero.

(iii) Unitary elastic supply ($e_s = 1$)

When the percentage change in quantity supplied of a commodity is equal to percentage change in its price, the supply of the commodity is said to be unitary elastic. It means if the price of the commodity increases by 50 per cent its quantity supplied will also increase by 50 percent. It can be explained with the help of the following supply schedule and supply curve.

Supply schedule of commodity X

Price per unit (₹)	Quantity supplied (units)
10	20
20	40
30	60
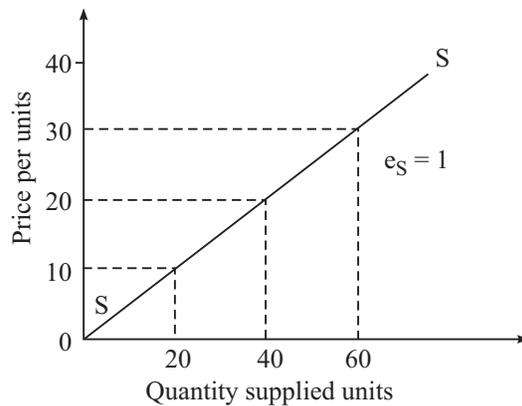
Fig. 20.4

The above supply schedule of commodity X shows that when the price increases by 100%, quantity supplied also increases by 100% and when the price increases by 50%, the quantity supplied also increases by 50%. The supply curve is passing through point of origin.

(iv) Elastic or more than unit elastic supply ($e_s > 1$)

When the percentage change in quantity supplied of a commodity is greater than the percentage change in its price, the supply of the commodity is said to be greater than unit elastic. It happens in case of durable goods because if the price falls they can be easily stored for future sale. If the price of such goods falls by 20%, their quantity supplied falls by more than 20%. In such cases, price elasticity of supply is greater than one. It can be explained with the help of the following supply schedule and supply curve.

Supply schedule of commodity A

Price per unit (₹)	Quantity supplied (units)
10	20
20	50
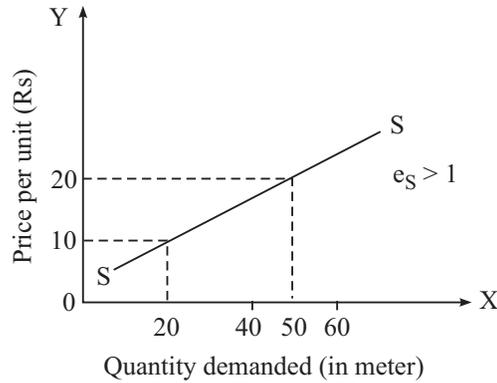
Fig. 20.5

In the above supply schedule price of the commodity increases by 100% but its quantity supplied increases by 150%. Thus, in this case, supply is more than unitary elastic.

(v) Perfectly elastic supply ($e_s = \infty$)

When the quantity supplied of a commodity expands or contracts to any extent without any change or with an infinitely small change in its price, the supply of the commodity is called perfectly elastic. Its supply curve is a horizontal line parallel to x-axis. It can be shown with the help of the following supply schedule and supply curve.

Supply schedule of commodity B

Price per units (₹)	Quantity supplied (units)
10	100
10	200
10	300
10	400
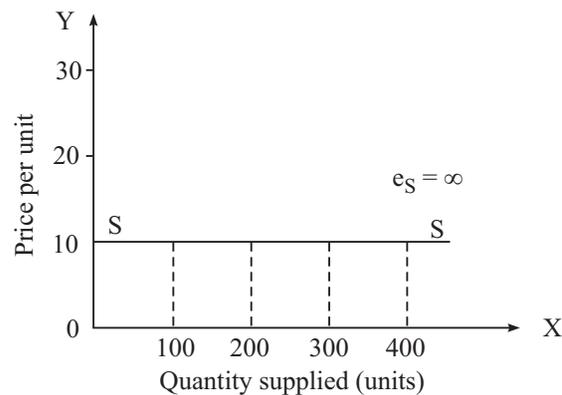
Fig. 20.6

The above supply schedule and supply curve show that at a price of ₹ 10 per unit the quantity supplied of the commodity may be 100, 200, 300 or 400 units. This type of supply is unrealistic because it is not possible in real life.

INTEXT QUESTIONS 20.1

1. Define price elasticity of supply.

2. What is the co-efficient of perfectly elastic supply.

3. What is the main feature of unitary price elasticity of supply.

4. What is price elasticity of supply if the supply curve cut y-aixs at a point above the point origin.

5. What is price elasticity of specify if the supply curve cuts x-axis in the positive range.

6. Define perfectly price inelastic supply.

Notes

20.3 MEASUREMENT OF PRICE ELASTICITY OF SUPPLY

After knowing various degrees of price elasticity of supply we have to understand the methods of calculating price elasticity of supply. At this stage we shall discuss the following two methods that are used for calculating price elasticity of supply.

(i)   Percentage or Proportionate method

(ii) Geometric method

Detailed description of each method is given below:

20.3.1 Percentage or proportionate method

This is the most popular method of measurement of price elasticity of supply. With the help of this method we can calculate the accurate value of price elasticity of supply. This method measures the degree of responsiveness of quantity supplied of a commodity to change in its price. The price elasticity of supply is the ratio of percentage change in quantity supplied of a commodity to percentage change in its price. It can be calculated with the help of the following method:

$$e_s = \frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}}$$

$$e_s = \frac{\Delta Q_s}{\Delta P} \times \frac{P}{Q_s}$$

Notes

where ΔQ_s = change in quantity supplied

ΔP = Change in price

P = Original price

Q_s = Original quantity supplied

Percentage change in quantity supplied = $\dfrac{\Delta Q_s}{Q_s} \times 100$

Percentage change in price = $\dfrac{\Delta P}{P} \times 100$

If we take original price as P_1 and changed price as P_2 this ΔP will be $P_2 - P_1$. In the same way if we take original quantity as Q_1 and changed quantity as Q_2 then ΔQ will be $Q_2 - Q_1$. The value of price elasticity of supply is always positive because there is a direct relationship between price and quantity supplied of commodity. Now we give some solved examples of price elasticity of supply with the help of which we can easily calculate price elasticity of supply of a commodity.

Example 1: Calculate the value of price elasticity of supply of commodity A if the percentage change in price of the commodity is 10% and percentage change in its quantity supplied is 18%.

Solution:

$$e_s = \frac{\%\ \text{change in quantity supplied}}{\%\ \text{change in price}}$$

$$e_s = \frac{18}{10} = 1.80$$

Ans: Price elasticity of supply of commodity A is 1.80 (more than unit elasticity supply)

Example 2: A firm sells 40 units of commodity X when its price is ₹ 10. At what price it will sell 60 units of the commodity if its price elasticity of supply is 0.8.

Solution:

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

Notes

By putting the above question in a tabular form

$$P_1 = 10 \qquad\qquad Q_1 = 40$$

$$P_2 = ? \qquad\qquad Q_2 = 60$$

Here

$$\Delta Q = 60 - 40 = 20$$

$$\Delta P = P2 - 10$$

$$e_s = 0.8$$

$$0.8 = \frac{20}{P_2 - 20} \times \frac{10}{40}$$

$$0.8 \times 40(P_2 - 10) = 200$$

$$32P_2 - 320 = 200$$

$$32P_2 = 520$$

$$P_2 = 16.25$$

Ans: At a price of ₹ 16.25, the firm will supply 60 units of commodity X.

Example 3: If the price of oranges increases by 40% per kg and its quantity supplied increases from 100 to 125 kgs. Calculate price elasticity of supply of oranges.

$$e_s = \frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}}$$

$$e_s = \frac{\dfrac{125 - 100}{100} \times 100}{40\%}$$

$$= \frac{25\%}{40\%} = 0.625$$

Ans: Price elasticity of supply of oranges is 0.625 (less than units elastic supply)

20.3.2 Geometric method

Geometric method is also called the point method of calculating price elasticity of supply as with the help of this method we can calculate price elasticity of supply of a commodity at a point on the supply curve. Under this method we can calculate price elasticity of supply at a given point on the supply curve with the help of the following method. To measure price elasticity of supply at a point we extend the

Notes

supply curve so that it meets the x-axis at point B in its negative range, positive range or exactly at the point of origin. For this purpose we use the following formula:

$$e_s = \frac{BQ \text{ (Horizontal segment)}}{OQ \text{ (Quantity supplied)}}$$

See the figures below and use this formula.
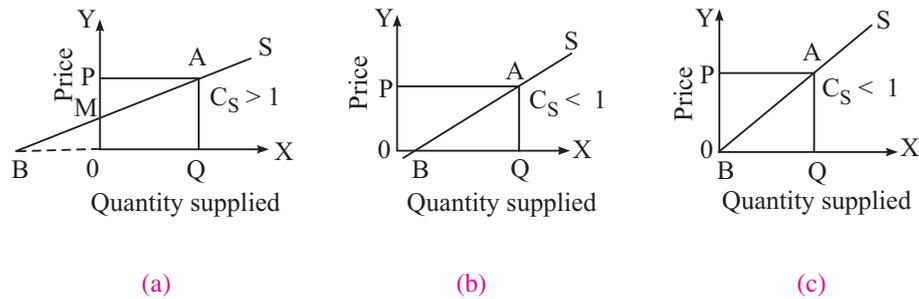
Fig. 20.7

In figure (a) the supply curve cuts price axis at point M. When we extend the supply curve it meets x-axis in its negative range at point B. Price elasticity of supply is calculated as under:

In figure (a) $e_s = \dfrac{BQ}{OQ} > 1$ because BQ > OQ

So supply curve cutting price axis is elastic in nature.

In figure (b) the supply curve meets x-axis in it positive range at points B. Price elasticity of supply is calculated as under

In figure (b) $e_s = \dfrac{BQ}{OQ} < 1$ because BQ < OQ

Hence supply curve cutting quantity axis is in elastic in nature.

In figure (c) supply curve it meets x-axis at the point of origin. Here the point O and B coincide. Price elasticity of supply is calculated as under:

In figure (c) $e_s = \dfrac{BQ}{OQ} = 1$ because BQ = OQ

So supply curve through the origin is unitary elastic.

So we can conclude that a straight line supply curve which intersects x-axis in its negative range imply $e_s > 1$. A straight line supply curve which intersect x-axis in its positive range implies $e_s < 1$ and a straight line supply curve which passes through the point of origin implies $e_s = 1$ irrespective of low steep or flat it is.

INTEXT QUESTIONS 20.2

1. When the price of a commodity increases by 20%, its supply increases by 30%. What is the price elasticity of supply?

2. At a price of ₹ 100 per unit, a seller supplies 300 units of a commodity. Calculate price elasticity of supply if he supplies 450 units of the commodity at a price of ₹ 200 per unit.

3. A seller supplies 100 unit of a commodity at a price of ₹ 40 per unit. How much quantity of the commodity will be supply at a price of ₹ 60 per unit if the price elasticity of supply is unity.

4. A seller of commodity A supplies 200 units at a price of ₹ 2 per unit. At which price will he supply 300 units of it, if the price elasticity of supply is 0.5.

5. What is price elasticity of supply of a straight line supply curve passing through the point of origin and making an angle of 70° to the x-axis.

6. What is price elasticity of supply if the straight line supply curve meets x-axis in its negative range.

20.4 FACTORS INFLUENCING ELASTICITY OF SUPPLY

In all the cases, the price and quantity supplied of a commodity are directly related. Here we shall study the factors that determine the degree of elasticity of supply of a commodity to a change in its price. The main factors determining elasticity of supply are given below.

(i) Nature of the commodity

The supply of perishable goods like fresh vegetables and fresh fruits is generally inelastic because it is very difficult to store them for future sale. These goods are prone to getting spoiled quickly and can not be kept for long period of time. So the supply of such goods does not change according to change in price. It is so because the seller prefers to sell them at cheaper rates than to spoil the goods totally.

On the other hand durable goods made by the industries do not get easily spoiled. If the price of such goods falls, they can easily be stored for sale when the price rises. So, the supply of such goods is more elastic to change in price. The goods whose supply can be postponed for future are more elastic than the goods whose supply can not be postponed for future.

Notes

(ii) Cost of production of additional units of a good

If the cost of production of additional units of a commodity increases sharply, the profit may not rise even if the price increases. In such cases, the producer is not interested in increasing the production in substantial quantity. The supply of such goods is relatively inelastic.

On the other hand if the marginal cost of additional unit decreases per unit, the producer will be motivated to increase the output with a little increase in price. In such a case the supply of the commodity is more elastic.

(iii) Time Period

Time period also influences the case with which the supply of the commodity can be changed. During very short period, supply can not be changed according to change in price. So the supply of the commodity is perfectly inelastic. During short period, the supply of the commodity can be changed by changing only variable factor and keeping all other factors as constant. So the supply can be changed only upto a certain extent to change in price. The supply of the commodity in short period is relatively inelastic. But during long period, the supply of the commodity can be changed to any extend by changing all the factor of production. So, in the long period the supply of the commodity can easily be changed. This makes the supply of the commodity more elastic.

INTEXT QUESTIONS 20.3

1. What is the elasticity of supply of a commodity in the short period?

2. What is the value of elasticity of supply in the long period.

3. How does the cost of production of additional units of output influences the elasticity of supply of a commodity.

4. How does nature of the commodity influence the elasticity of supply of a commodity?

WHAT YOU HAVE LEARNT

- Elasticity of supply is the degree of responsiveness of quantity supplied of a commodity to change in its price.

- There are five degrees of price elasticity of supply i.e. (i) perfectly inelastic supply (ii) less than unit elastic supply (iii) unitary elastic supply (iv) more than unitary elastic supply (v) perfectly elastic supply.

- There are two method of measuring price elasticity of supply (i) percentage or proportionate method (ii) geometrical method

- Price elasticity of supply depend on the following factors (i) nature of commodity (ii) cost of production of the additional units (iii) time period.

TERMINAL EXERCISE

1. Define price elasticity of supply.

2. If two supply curves intersect each other at a point which of them is more elastic.

3. What is meant by perfectly elastic supply?

4. What is the distinguishing feature of unitary elastic supply?

5. What is the value of elasticity of supply in very short period?

6. What is the value of elasticity of supply in the long period?

7. State any three factors determining price elasticity of supply.

8. Explain the percentage method of determining elasticity of supply.

9. State the geometric method of measuring elasticity of supply on a straight.

10. Explain the three factors that affect the elasticity of supply.

11. At a price of ₹ 100 per unit, a seller sells 200 unit of the commodity and at a price of ₹ 50 per unit, he sells 100 units of the commodity. Calculate elasticity of supply.

12. Price elasticity of supply of a commodity is 1.5. The seller sells 1000 unit of the commodity at a price of ₹ 4 per unit. How many unit of the commodity will be sold at a price of ₹ 5 per unit.

13. At a price of ₹ 10 per unit, a firm earns total revenue as ₹ 5000. When the price rises ₹ 15, the firm earns ₹ 10000 as total revenue. Calculate its elasticity of supply and comment on it.

14. The price elasticity of supply of a commodity is 3. When its price falls from ₹ 10 to ₹ 8 its quantity suppled falls by 400 units. Calculate quantity supplied at reduced price.

ANSWERS TO INTEXT QUESTIONS

20.1

1. Read section 20.1

2. $e_s \propto$ [Read section 20.1 (v)]

Notes

3. Read section 20.1 (iii)

4. $e_s > 1$ [Read section 20.1 (iv)]

5. $e_s < 1$ [Read section 20.1 (iv)]

6. Read section 20.1 (i)

20.2

1. $e_s = 1.5$

2. $e_s = 0.5$

3. Quantity supplied is 150 units

4. Price = 4

5. Unitary elastic

6. $e_s > 1$

20.3

1. $e_s < 1$ [Read section 20.4 (iii)]

2. Read section 20.4 (iii)

3. Read section 20.4 (ii)

4. Read section 20.4 (i)

MODULE - VIII
MARKET AND PRICE DETERMINATION

21

FORMS OF MARKET

You are familiar with the term market. Market is the major source of distribution of goods and services. The purpose of producing goods is to sell them to the consumers who demand them. To sell the goods (and services) we need the medium of market. In today's world a buyer can get so many types of goods in the market. What are the different forms of market? As students of economics you must know the forms of market. This lesson is denoted for towards this.

OBJECTIVES

After completing this lesson, you will be able to:

- understand the concept of market;

- know the meaning of perfect competition and its features;

- explain the meaning of monopoly and its features;

- understand the meaning of monopolistic competition and its features;

- understand the meaning of oligopoly and its features; and

- draw a comparison among different forms of market.

21.1 WHAT IS A MARKET

Market is the heart and soul of modern economic life. Without market, producers' and consumers' activities hardly make any sense. In common parlance, market is assumed to be a place where goods are bought and sold. But in economics, the term 'market' does not refer to a specific place. Rather, it is a mechanism through which buyers and sellers come into contact with each other and buy and/or sell goods at mutually agreed prices.

Main features of a market include:

(a) **Buyers and Sellers:** Buyers and sellers must come into contact with each other for a market to exist. It is only after the contact between the buyer and the seller, that a transaction takes place.

(b) **Area:** You can easily find a market place nearer to a human settlement. But in today's world, the market is not limited to a particular place. Today, in the age of Internet, we have a rapidly growing online market which is not limited to any geographical area. A buyer can place order to buy a good online. So modern Market exists physically and virtually.

(c) **Commodity:** The transaction between buyer and seller has to be over some good or service. So a commodity becomes the integral part of a market.

(d) **Different forms of Competition:** Forms of market depends on the degree of competition among the sellers selling the goods, where the degree of competition it self is determined by the inter relationship of among the goods and services sold by different sellers as well on number of sellers present in the market.

(e) **Money transaction:** Money is the mediums of exchange in the modern day world. Consumers pay money to the seller to buy goods as services in the market. So money and market are inseparable.

21.2 BASIS OF DIFFERENT MARKET FORMS

Different forms of market can exist on the basis of some distinguished characteristics. Some of these characteristics are:

(a) **Number of Firms:** Number of firms in a market indicates the degree of control of a firm on the price of a commodity. For example, if there is a large number of firms competing against each other, a single firm supplies just a miniscule part of market supply and hence cannot influence the market supply and consequently the price significantly. Similarly, if there is only one firm in the market, it becomes the sole determinant of the market supply and therefore, exercises a great degree of control over the price.

(b) **Ease of Entry and Exit of the Firms:** If the firms can easily enter a particular market or can leave the market without much loss, the price will be stable and profits will be just normal in the long run. In case there are restrictions on entry of new firms, the degree of control of existing firms increases and the possibility of earning higher profits also increases as the firms have a lesser degree of competition in such a case.

(c) **Degree of Product Differentiation:** It simply means how unique the product offered by a particular firm is. The greater the degree of uniqueness (or higher degree of product differentiation), the greater is the control exercised by that

firm over its pricing decisions. In case, the goods offered by different firms are homogeneous, the individual firms lose their control over the market in price determination.

21.3 DIFFERENT FORMS OF MARKET STRUCTURE

Based on the above mentioned characteristics, we can classify different markets in the way as shown in the following chart

```
                    ┌──────────────┐
                    │   Market     │
                    │  Structure   │
                    └──────────────┘
                    ┌──────┴───────┐
            ┌───────────────┐  ┌───────────────┐
            │   Perfect     │  │  Imperfect    │
            │   Market      │  │   Market      │
            └───────────────┘  └───────────────┘
                         ┌──────────┼──────────┐
              ┌───────────┐ ┌──────────────┐ ┌───────────┐
              │ Monopoly  │ │ Monopolistic │ │ Oligopoly │
              │           │ │ Competition  │ │           │
              └───────────┘ └──────────────┘ └───────────┘
```
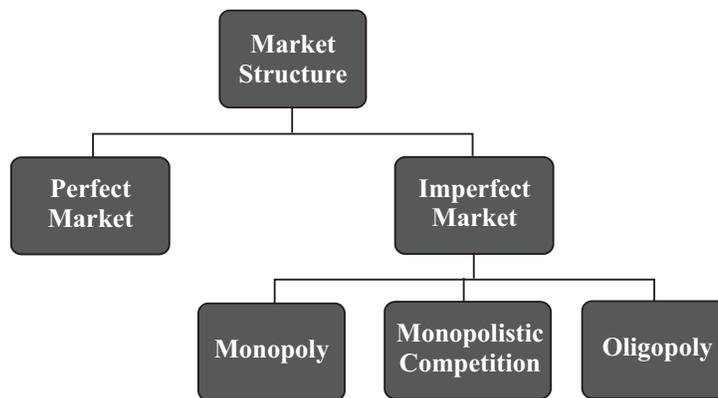
On the basis of degree of competition among sellers, we can say that while monopoly does not have any competition, on the otherhand perfect competition has maximum degree of competition. Oligopoly and monopolistic competition lie between these two extreme market forms.

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  Perfect      Monopolistic   Oligopoly    Duopoly       Monopoly
competition    competition              (A sub-category
                                         of oligopoly)
```

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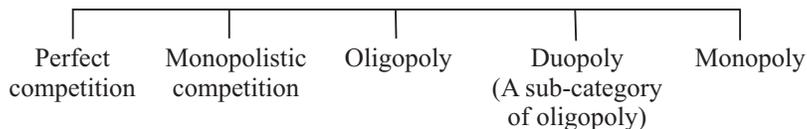
INTEXT QUESTIONS 21.1

1. What is a market? Explain its salient features.

2. Define market structure?

3. Bring out main features of a market.

4. On what basis, can different market structures be distinguished from one another?

5. Which is the most competitive market structure?

6. Which is the least competitive market structure?

7. Is it necessary for a market to be some specific place?

Notes

21.3.1 Perfect Competition

Like any other market structure, Perfect Competition is defined on the basis of its features. Perfect Competition is a market structure in which there is a large number of buyers and sellers who transact homogeneous or similar goods at a price fixed by the market or industry. Here, industry is a group of firms producing similar goods.

Features of Perfect Competition: Perfect Competition is characterized by:

1. **Very Large number of buyers and sellers:** In a perfectly competitive market, there is a very large number of buyers and sellers. For instance, if a single seller tries to raise the price, there is a large number of other sellers selling identical product at a lower price. Therefore, the demand for this particular firm decreases forcing it to come in line again with the industry determined price.

2. **Homogeneous Product:** The products offered by different firms are homogeneous in every respect so that the buyer does not have any basis to prefer the goods of one seller over the goods of another seller. The goods are identical in terms of quality, size, packing, and other terms of deal etc. This feature ensures the uniformity of the price throughout the market.

3. **Firm is a Price Taker:** The firm has to sell the goods at a price determined by the industry as the firm has no control over the price. The market or industry determines this price on the basis of market demand and market supply as shown in the figure. So industry is the price maker and firm is the price taker.

4. **Free Entry and Exit:** Under perfect competition firms are free to enter into the market or exit from the market at any point of time. This means that there is no obstruction from any where for a new firm to produce the same product produced by the existing firms in the market; similarly if a firm wishes to exit then it is free to do so.

5. **Perfect Knowledge:** This feature implies that both sellers and buyers have perfect knowledge about the goods and their prices so that it is not possible for a firm to charge a different price. It also ensures uniform price for the buyers and uniform cost function for the producers.

6. **Perfect Mobility:** The goods as well as the factors of production are perfectly mobile so that there is no restriction- legal or monetary (involving expenditure in movement of goods). This feature ensures that the price throughout the market tends to be uniform.

7. **No Selling Costs:** Selling costs are the costs aimed at promotion of sales of product of a firm, e.g. expenditure on advertisement of a product. In perfect competition, there is no need to incur selling cost because of assumption of

perfect knowledge and homogeneous goods. This implies that if people have complete knowledge about the product, the seller does not find it necessary to educate consumers through advertisements. Similarly, when goods are homogeneous, there is no basis on which the seller can claim superiority of his products over the products of its rivals.

8. **Shape of Demand Curve:** Under perfect competition, the demand curve for the firm is horizontal and perfectly elastic. It means that the firm can sell any amount of the product at the price determined by the industry, but the firm cannot vary the price.

Fig. 21.1

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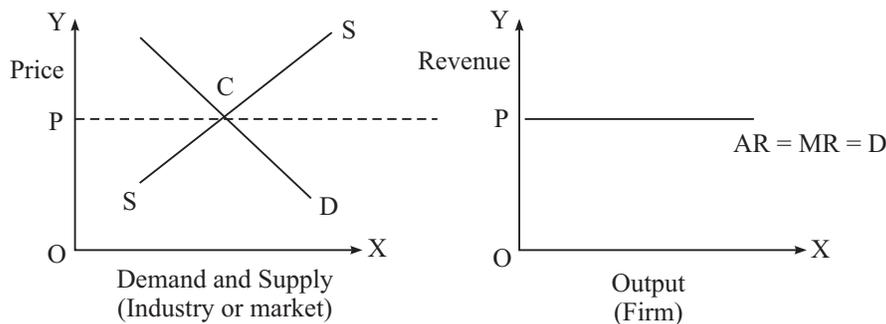
INTEXT QUESTIONS 21.2

1. What is perfect competition? Explain its various features.

2. What is the relevance of the feature of 'large number of buyers and sellers' in perfect competition?

3. Why is there no need of selling cost in perfect competition?

4. What is the shape of demand curve for a product under perfect competition?

5. Why do firms earn only normal profits under perfect competition in the long run?

6. Under perfect competition, firm is a price-taker and not price maker. Explain.

7. Under perfect competition, all the firms sell their goods at the same price.

(True/False)

21.3.2 Monopoly

Monopoly is a market structure in which there is a single seller, there are no close substitutes for the commodity produced by the firm and there are barriers to entry.

Example: Indian Railways which is operated under government of India.

Monopoly also implies absence of competition.

Notes

Features of Monopoly: Monopoly is characterized by:

1. **Single Seller:** In monopoly, there is only one firm producing the product. The whole industry consists of this single firm. Thus, under monopoly, there is no distinction between firm and industry. Being the only firm, there is significant control of the firm over supply and price. Thus under monopoly, buyers do not have the option of buying the commodity from any other seller. They have to buy the product from the firm or they can go without the commodity. This fact gives immense control to the monopolist over the market.

2. **No Close Substitute:** There are no close substitutes of the product produced by the monopolist firm. If there are close substitutes of the product in the market, it implies presence of more than one firm and hence no nonopoly. In order to ensure a total of control over the market by the monopolist firm, it is assumed that there are no close substitutes of the product.

3. **No to Entry:** Monopoly can only exist when there is strong barriers before a new firm to enter the market. In fact once a monopoly firm starts producing the produt, no other firm can produce the same. One reason for this is the ability of the monopolist to produce the product at a lower cost than any new firm who thinks to enter the market. If a new firm who knows that it can not produce at a lower cost than the monopolist, then the that firm will never enter the market for fear of loosing out in competition. Similarly the monopolist who is operating for a long time may be enjoying reputation among its customers and is in a better position to use the situation in its own benefit. A new firm has to take long time to achieve this and so may not be interested to enter the market.

4. **Price Maker:** Being the single seller of the product, the monopolist has full control over the pricing of the product. On the other hand, if there is a large number of buyers in the market, so no single buyer exercises any significant influence over price determination. Thus, it is a seller's market. So monopoly firm is a price maker.

5. **Price Discrimination:** Having considerable control over the market on account of being single seller with no entry of other firms, the monopolist can exercise policy of price discrimination, it means that the monopolist can sell different quantities of the same product to a consumer at different price or same quantity to different consumers at different prices by adjudging the standard of living of the consumer.
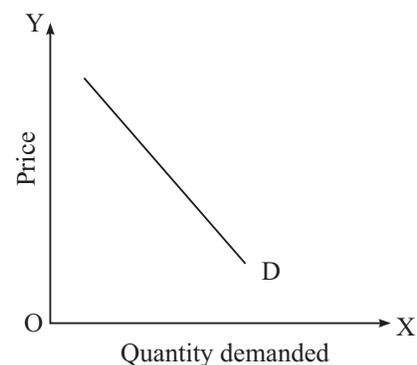

Fig. 21.2

6. **Shape of Demand Curve:** Since a monopolist has full control over the price, therefore, he can sell more by lowering the price. This makes the demand curve downward sloping. As there is no competition of the firm in the market, demand curve is in elastic. See figure 2.

INTEXT QUESTIONS 21.3

1. What is monopoly? Explain its features.

2. Draw a comparison between perfect competition and monopoly.

3. In what forms, can there be barriers to entry of other firms? What role do these barriers play?

4. Why do we assume that there are no close substitutes of the goods produced by a monopolist?

5. What kind of profits are earned by a monopolist in the long run and why?

6. Define price discrimination.

7. Under monopoly, firm is price taker.   (True/False)

21.3.3 Monopolistic Competition

Monopolistic Competition is a market structure in which there is a large number of sellers in the market of a commodity, but the product of each seller differs in some respect from the product of the other sellers. Thus, product differentiation is the cornerstone of Monopolistic Competition. Monopolistic competition is like an amalgam of monopoly and perfect competition, and hence the name Monopolistic Competition. According to J.S. Bains, "Monopolistic Competition is a market structure where there is a large number of sellers, selling differentiated but close substitute products."

Example: Restaurants, Market for Toothpaste etc.

Features of Monopolistic Competition

Monopolistic Competition is characterized by:

1. **Large number of firms:** Under monopolistic competition, there is a large number of firms selling closely related products. Thus the control of a particular firm is somewhat diminished when compared to that of monopoly.

2. **Product Differentiation:** Product Differentiation is a very important feature of Monopolistic Competition. This differentiation could be on the basis of quality, packaging, colour etc. or this differentiation could also be just a matter of perception.

   For example: You must have seen different brands of tooth paste. Even if they look different having different taste, the produt it has same use.

Notes

3. **Selling Costs:** Under monopolistic competition firms spend a lot on advertisement of their product in order to attract the customers and sell their product. Every firm tries to promote its product through advertisement for which it bears some extra cost ove and above its cost of production. This is calle selling cost.

4. **Non-Price Competition:** Under Monopolistic Competition, sometimes, firms compete with each other without changing price. They may start various promotion schemes, gift schemes or compete in terms of advertisement etc. Thus, firms compete under in every possible way to attract consumers and gain maximum possible market share.

5. **Nature of Demand Curve:** Like monopoly, Monopolistic Competition also has a downward sloping demand curve. However due to the existence of competitors in the market, the degree of steepness of the curve is little less, reflecting greater price elasticity of demand and less control of the firm than that of monopoly. (see figure 21.3).
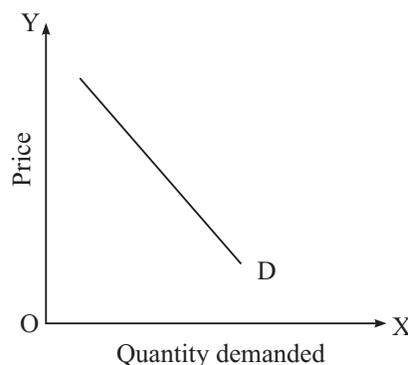
Fig. 21.3

INTEXT QUESTIONS 23.4

1. Define monopolistic competition. Explain its features

2. Draw comparison between perfect competition and Monopolistic competition.

3. Draw comparison between monopoly and monopolistic competition.

4. Explain product differentiation under monopolistic competition.

5. Monopolistic competition is an amalgam of monopoly and perfect competition. Explain.

6. Explain 'Non-price competition'.

7. Fill in the blanks with appropriate words:

   (i) Under monopolistic competition, the number of firms is ....

   (ii) Demand curve under monopolistic competition is .... sloping.

   (iii) Product differentiation is the cornerstone of ....

21.3.4 Oligopoly

Oligopoly is an important form of imperfect competition. Oligopoly exists when there are few firms selling the product. W.H. Fellner wrote a book on oligopoly

Notes

with the title, "Competition among the Few". This title aptly summarizes what oligopoly is. Oligopoly can simply be defined as the competition among the few firms. The products of these firms may either be close substitutes or homogeneous.

Example: Mobile service providers, car industry, airlines etc.

A. Features of Oligopoly

Oligopoly is characterized by following features:

1. **Interdependence:** Interdependence is a very significant feature of Oligopoly. When the number of firms is small, any strategy regarding change in price, output or quality of a product, will depend on the rival's reaction for its success. Thus, the success of price reduction policy by one company (say, Pepsi) will depend on reaction by its rival (say, Coke). For example, if Pepsi lowers the price per bottle from Rs 10 to Rs 8, the effect of this step on demand for Pepsi will depend on the counter-strategy of Coke. If Coke decides to follow price war strategy and lowers price from Rs 10 per bottle to Rs 7 per bottle, demand for Pepsi may decrease even below its initial level.

2. **Indeterminate Demand Curve:** Demand curve presents different quantities of a product demanded at various prices. However, demand for a product at different prices can be known only when rivals' counter strategies can be predicted with certainty. This being not possible, we cannot draw the usual demand curve for the firm's product in case of oligopoly.

3. **Selling Costs:** Oligopoly firms bear selling cost such as advertisement, sales promotion etc. to sale the product.

4. **Group Behaviour:** Since there are a few firms under oligopoly, there is a tendency among them to come together in order to avoid competition. They may meet secretly to negotiate price and quantity in the market. The aim is to maximise profit in the same manner as a monopolist does. Obviously when they come together it looks as if all firms have become a single entity like a monopolist. But such groupism is done secretly as the government may take action if it comes to know about this type of group behaviours of firm where in firms are trying to reduce competition among themselves. Note that when firms form a group secretly to share profit or quantity etc. it is called collusive oligopoly. When firms work independently and compete with each other, it is called non-collusive oligopoly.

5. **Price Rigidity:** In oligopoly market, once the price of the produt is fixed by the firms, it is normally not changiable. So price is rigid. The reasons for this is that firms face different types of consumers having different elasticities of

Notes

demand. So response of change in quantity due to change in price many vary from one firm to another creating uncertainty about future sales. So fearing this firms do not change price once its is fixed.

B. Types of Oligopoly

Oligopoly may further be classified into collusive oligopoly and non-collusive oligopoly.

(a) Collusive oligopoly

The firms under oligopoly may decide to co-operate with each other and make common policies for all the firms. Thus, firms may collude with each other work on common pricing policies and make common output decisions. In such an environment, the group of firms can behave like a monopolist and earn supernormal profits. This group of colluding firms is called 'cartel'. One prominent example of cartel is 'the Organization of Petroleum Exporting Countries (PEC)'.

(b) Non-collusive oligopoly

When firms do not co-operate with each other and engage in fierce competition with each other, the market is called non-collusive oligopoly. Under such environment, while competing with each other, firms drive price levels, and profit levels down to the level of normal profit only.

INTEXT QUESTIONS 21.5

1. What is oligopoly? Explain its features.

2. Define oligopoly. Give example.

3. Explain nature of demand curve under oligopoly.

4.   'Interdependence' and 'Group Behaviour' are two very important features of oligopoly. Comment.

5. What is collusive oligopoly?

6. What is non-collusive oligopoly?

TERMINAL EXERCISE

1. Define a market. What are different types of market?

2. What is Perfect Competition ? Explain its features briefly.

3. What is Monopoly ? Explain its features briefly.

4. What is Monopolistic Competition ? Explain its features briefly.

5. Fill in the blanks:

    (a) Price determination by industry is a feature of ....

    (b) Under Oligopoly, price tends to be ....

    (c) In Monopoly, the number of firms is ....

    (d) Product Differentiation is the corner stone of ....

    (e) Interdependence is the most important feature of

    (f) Market is a place, a particular geographical location.   (True/False)

Notes

ANSWERS TO INTEXT QUESTIONS

21.1

1. Refer to 21.2

2. Refer to 21.3

3. Refer to 21.2

4. Refer to 21.3

5. Perfect competition

6. Monopoly

7. No

21.2

1. Refer to 21.3.1

2. Refer to 21.3.1 pt. 1

3. Refer to 21.3.1 pt. 7

4. Refer to 21.3.1 pt. 2

5. Refer to 21.3.1 pt. 4

6. Refer to 21.3.1 pt. 2

7. True

21.3

1. Refer to 21.3.2

2. Refer to 21.3.1 and 21.3.2

3. Refer to 21.3.2 point No. 3

4. Refer to 21.3.2 point No. 2

5. Refer to 21.3.2 point No. 3

Notes

6. Refer to 21.3.2 point No. 6

7. False

21.4

1. Refer to 21.3.3

2. Refer to 21.3.1 and 21.3.3

3. Refer to 21.2 and 21.3

4. Refer to 21.3.3 point No. 2

5. Refer to 21.3.3

6. Refer to 21.3.3 point No. 4

7.   (i)   large

    (ii)   downward

    (iii)   monopolistic competition

21.5

1. Refer to 21.3.4 and 21.4.4 (A)

2. Refer to 21.3.4 (A)

3. Refer to 21.3.4 (A) point No. 2 and 6

4. Refer to 21.3.4 (A) point No. 1 and 4

5. Refer to 21.3.4 (B) part (a)

6. Refer to 21.3.4 (B) part (b)

22

PRICE DETERMINATION UNDER PERFECT COMPETITION

One of the objectives of firm and industry is to maximize profit. As an alternative, the firm also wants to minimize loss. Whatever it may be, a firm must determine the price and quantity that will ensure achieving these goals. The manner in which a firm/industry determines the price and output depends on the market form in which it is operating. In the preceeding lesson, you learnt that there are various forms of market in which a firm or industry operate. This lesson is devoted towards determination of price and quantity by the industry and a firm under the market form or perfect competition.

OBJECTIVES

After completing this lesson, you will be able to:

● explain the meaning of equilibrium price;

● explain the process by which the twin market forces of demand and supply determine the equilibrium market price of a commodity under perfect competition;

● explain the concepts of excess demand and excess supply;

● identify the effects of change in demand and/or supply on equilibrium price and quantity; and

● understand the process of price determination of a competitive firm.

22.1 MEANING OF EQUILIBRIUM PRICE

Equilibrium means a position from which there is no tendency to change.

Prof. Marshall compared demand and supply to the two blades of a pair of scissors. A moment of reflection will show that it is not blade alone that cuts the cloth. Both the blades together, do it. Similarly, it is not demand or supply alone that determines the price of a commodity. Together through interaction they determine the equilibrium price of a commodity.

The forces of demand and supply determine the price of a commodity. There is a conflict in the aim of producers and consumers. Producers want to sell the goods at the highest price to maximize profit and consumers want to buy the goods at the lowest price to maximize satisfaction.

Equilibrium price will be determined where quantity demanded is equal to quantity supplied in the market. This is called market equilibrium price of the commodity.

Industry Demand and Supply Under Perfect Competition

In lesson 21, you have learnt that the industry under perfect competition is defined as the collection of Large number of firms producing the homogeneous product. In such a situation no firm enjoys any power to determine its own price. The price of the commodity is determined at the level of the industry through the interaction of the forces of demand and supply of the commodity in the market. Since industry is the price maker, the industry demand curve is downward sloping (same as the market demand for a product given in lesson 15). Similarly the industry supply curve of the product is an upward sloping curve (same as the market supply curve given lesson 19).

22.2 PROCESS OF ARRIVING AT EQUILIBRIUM PRICE

Consider the following schedule 22.1 showing market demand and market supply of good X are given..

Table 22.1 Determination of Equilibrium Price of good X.

Price (₹ Per kg)	Market Demand (kg)	Market Supply (kg)
6	16	24
5	18	22
4	20	20
3	22	18
2	24	16

Let us assume that the initial price is ₹ 6 per kg and the respective levels of quantity demanded and supplied are 16 and 24 kg respectively. Obviously, quantity supplied at this price is exceeding quantity demanded. So, the suppliers or producers will offer a lower price to the buyers to ensure that their goods do not remain unsold. So, the price gradually moves from ₹ 6 to ₹ 5 per kg. At this relatively lower price, demand expands to 18 kg while supply contracts to 22 kg (in accordance with the respective laws of demand and supply), but still there is a gap between supply and demand. So the suppliers still feel that all of their goods might not sell in the market as quantity demanded is less than quantity supplied. So, they reduce price further so as to ensure that their goods do not remain unsold. This process continues till the price level reaches a point where quantity demanded equals quantity supplied. Thus, when the price falls from ₹ 5 to ₹ 4, quantity demanded as well as quantity supplied is equal to 20 kg. Now the suppliers have no reason to reduce their price further. Hence as long as quantity supplied exceeds the quantity demanded, price of the commodity keeps falling till both become equal.

Note that, when supply exceeds demand, we call it excess supply that causes price to fall till demand and supply become equal to each other.

On the otherhand, at a very low price of ₹ 2, quantity demanded in 24 kg which is higher than quntity supplied of 16 kg. Since demand is higher then supply, price of the commodity increases to ₹ 3. At ₹ 3, the quantity demanded is 22 kg which is still higher than the quantity supplied of 18 kg. This further results in increase in price to ₹ 4 where we find that quantity demanded and supplied have become equal at 20 kg.

Hence as long as quantity demanded exceeds the quantity supplied, the price of the commodity keeps increasing till both demand and supply become equal to each other.

Note that when demand exceeds supply, we call it excess demand that causes price to rise till demand equals supply.

In the example, at ₹ 4, demand and supply of the commodity are equal and hence there is no reason for the price to fluctuate from here. Hence ₹ 4 is the equilibrium market price. At this price 20 kg is equilibrium quantity.

The process of price determination has also been explained with the help of figure 22.1. In the figure, DD is the demand curve and SS is the supply curve. The negative slope of demand curve DD indicates a negative relation between price of

the commodity and its quantity demanded. Similarly, positive slope of the supply curve SS indicates a positive relation between price of the commodity and its quantity supplied. Demand curve DD and supply curve SS intersect each other at point E, which is the point of equilibrium at which equilibrium price is ₹ 4 per kg. and equilibrium quantity demanded and supplied is 20 kg. Equilibrium price is also defined as the price at which demand curve and supply curve intersect each other. (alternatively, equilibrium price is the price at which quantity demanded of a commodity equals its quantity supplied).
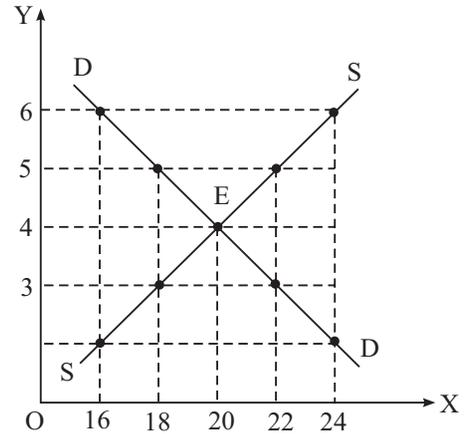
Fig. 22.1

## Price Determination for a Firm under Perfect Competition

Under perfect competition, the industry determines the price following the same route of adjustment as described above with the help of twin market forces of demand and supply. Firms have to accept the price determined by the industry and offer their output at this price. This canbe shown with the help of the following figure.
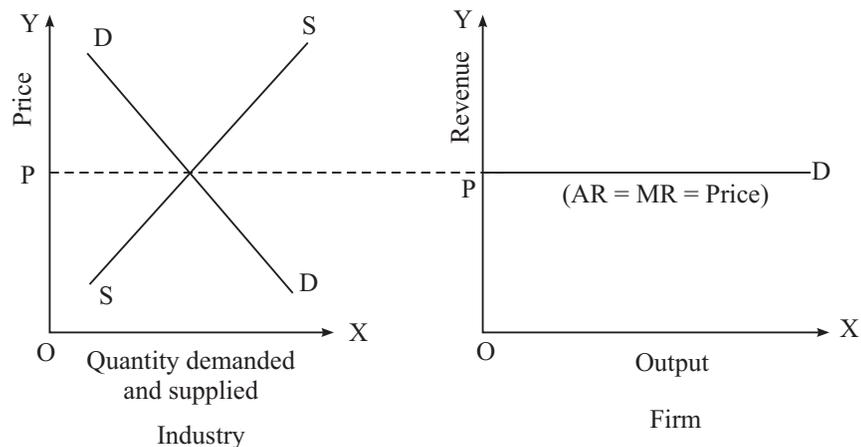

Fig. 22.2

Industry		Firm					
Price (₹ per kg)	Quantity Demanded (kg)	Quantity Supplied (kg)	Price (₹ per kg)	Quantity Supplied	TR (P×Q)	AR AR = P	MR
2	20	12	4	0	0	4	–
3	18	14	4	1	4	4	4
4	16	16	4	2	8	4	4
5	14	18	4	3	12	4	4
6	12	20	4	4	16	4	4

Notes

Under perfect jcompetition at price ₹ 4 per kg industry demand and industry supply are both equal to 16 kg and hence the equilibrium price determined by the industry is ₹ 4 per kg which has to be followed by all the firms of the industry. The firm may sell any quantity but the price remains constant at ₹ 4 per kg. That is why AR = MR in perfect competitioin, and are represented by a revenue curve which is parallel to x-axis.

INTEXT QUESTIONS 22.1

1. Define equilibrium price.
2. Which force of price determination is relatively more important and why?
3. Can we have two levels of equilibrium price for demand curve DD and supply curve SS? Support your answer with reason.
4. Tick the correct answer:
    (i) Point of intersection of demand curve and supply curve shows:
        (a) The equilibrium price
        (b) The equilibrium quantity
        (c) Neither of the two
        (d) Both equilibrium price and quantity
    (ii) Equilibrium price of a commodity is the price at which
        (a) Quantity demanded and supplied, both rise
        (b) Supply is maximum'
        (c) Demand is maximum
        (d) Quantity demanded and supplied are equal.

(iii) Equilibrium means

    (a) The variables are changing continuously

    (b) Demand and supply are unequal

    (c) The variables show no tendency to change

    (d) None of the above

(iv) If at some particular price, the quantity demanded exceeds its quantity supplied, then

    (a) Price will rise

    (b) Demand will fall

    (c) Supply will increase

    (d) All of the above

Let us now explain the excess demand and excess supply situation by using diagrams.

22.3 EXCESS DEMAND

Excess Demand is the gap between demand and supply when demand is more than supply. If at a given price, the quantity demanded of a commodity exceeds its quantity supplied we have excess demand. For example, in the table 22.1, when price is ₹ 2 per kg., demand is 24 kg. while supply is just 16 kg. So this is a situation of excess demand.

Process of Adjustment

One very interesting and important feature of price mechanism is that any disequilibrium is self-correcting. Thus if there is excess demand at any price, price will move in such a way so as to bring equilibrium between demand and supply. In Fig. 22.1, when price is ₹ 2, quantity demanded is 24 kg but quantity supplied is just 16 kg. So there is excess demand of 24 – 16 = 8 kg. In this situation, buyers realize that some of them will have to go without the commodity as supply is less than that of demand. So they compete to buy the product and in the process, offer a higher price. So, effectively price moves from ₹ 2 to ₹ 3 per kg. At this relatively higher price, demand contracts from 24 kg to 22 kg and supply expands from 16 to 18 kg. So, the magnitude of excess demand has diminished from 8 kg to 4 kg, but still there is a gap and some of the buyers have still to go without the commodity. So there is still competition, which raises the price further to ₹ 4 per kg, where demand contracts further to 20 kg and supply expands to 20 kg. Now, both quantity demanded and quantity supplied are equal.
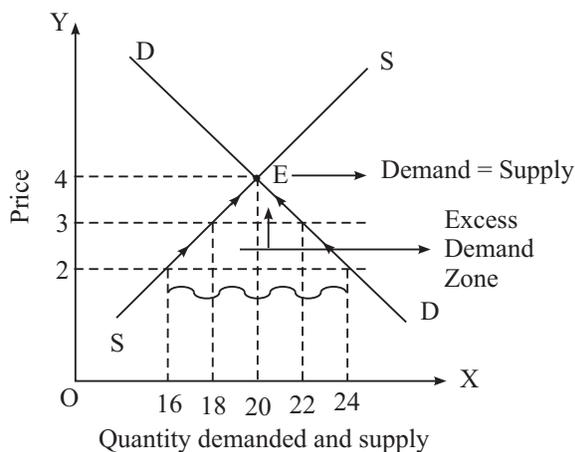
Fig. 22.3

So, the equilibrium has been brought about by increase in price, which also contracts demand and expands supply. We can summarize the process as follows:

(a) In case of excess demand, price starts rising, as the buyers try to compete out each other.

(b) As a result of rise in price, demand starts contracting and supply starts expanding.

(c) All these movements of price, demand and supply result in getting equilibrium restored, though at a higher price, than before.

22.4 EXCESS SUPPLY

Excess Supply is the gap between demand and supply when Supply is more than demand. If at a given price, the quantity supplied of a commodity exceeds its quantity demanded we have excess Supply. For example, in the table 22.1, when price is ₹ 6 per kg., demand is 16 kg. while supply is just 24 kg., obviously this is a situation of excess Supply.

Process of Adjustment

When quantity supplied is more than quantity demanded at price of ₹ 6 per kg., the suppliers are now worried as they know that because of excess supply, all of their goods might not be sold. Every supplier now wants to ensure that his goods are not left unsold. In a bid to ensure this, the supplier, tries to lure consumers by lowering the price to ₹ 5 per kg. But other suppliers are also doing precisely the same. So, the price effectively falls to ₹ 5 per kg. But even at this relatively lower price, supply still exceeds demand by 4 kg. and so another cycle of offering a lower

price starts. This continues till the price reaches the level of ₹ 4 per kg where quantity demanded equals quantity supplied. At this price, suppliers have no reason to offer a lower price, as they know that at this price all their goods are going to be sold. So the equilibrium in this case has been brought about by decrease in price, which also contracts supply and expands demand.
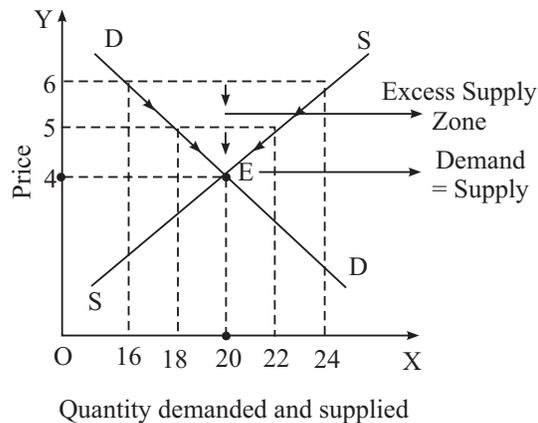
Fig. 22.4

We can summarize the process as follows:

(a) In case of excess supply, price starts falling, as the suppliers try to compete out each other.

(b) As a result of fall in price, demand starts expanding and supply starts contracting.

(c) All these movements of price, demand and supply result in getting equilibrium restored, though at a lower price, than before.

INTEXT QUESTIONS 22.2

1. What is excess demand?

2. What is excess supply?

3. How is equilibrium between demand and supply restored in case of excess demand?

4. How is equilibrium between demand and supply restored in case of excess supply?

5. Explain the effect of adjustment process on price, demand and supply in case of excess demand?

6. Explain the effect of adjustment process on price, demand and supply in case of excess supply?

22.5 EFFECT OF CHANGE IN DEMAND ON EQUILIBRIUM PRICE AND QUANTITY

As demand and supply are the twin forces determining the equilibrium price of a commodity, any change in either or both of them is bound to bring in some change in price. We will study, in this section, the effect of change in demand, supply held constant.

(i) Effect of Increase in demand

When due to any external factor such as rise in population, rise in income of people, demand for a commodity increases (for every price level), the demand curve shifts rightwards. As a result, it now intersects the supply curve at a new, higher level, which causes the price to rise. As shown in the figure below, initial demand curve DD intersects supply curve SS at point e.
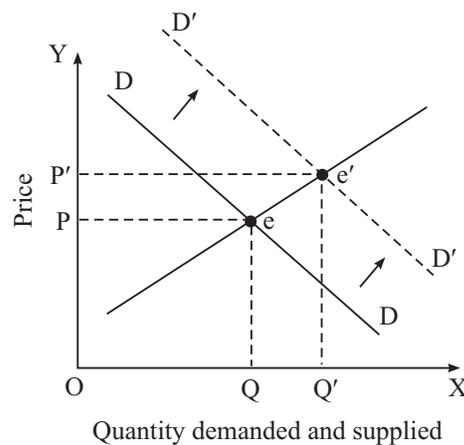
Fig. 22.5

The equilibrium price is OP and the equilibrium quantity demanded and supplied are OQ. Now, suppose demand increases and as a result, demand curve shifts rightwards. This new demand curve D'D' intersects the supply curve SS at pointt e'. So, the new equilibrium price is OP' which is higher than the earlier. price OP. It may also be noted that the equilibrium quantity demanded and supplied have also risen from OQ to OQ'.

(ii) Effect of Decrease in Demand

When due to any external event such as fall in income level, demand for a commodity falls, the demand curve shifts leftwards. So, this new demand curve intersects supply curve at a lower level which causes the price to fall. As shown in

the figure 22.8, initial demand curve DD intersects the supply curve SS at point e.

The equilibrium price is OP and the equilibrium, quantity demaned and supplied are OQ. Now, suppose demand decreases and as a result, demand curve shift leftwards. This new demand curve D'D' intersects the supply curve SS at point e'. So, the new equilibrium price is OP' which is lower than the earlier price OP. It may also be noted that the equilibrium quantity demanded and supplied have also decreased from OQ to OQ'.

Quantity demanded and supplied
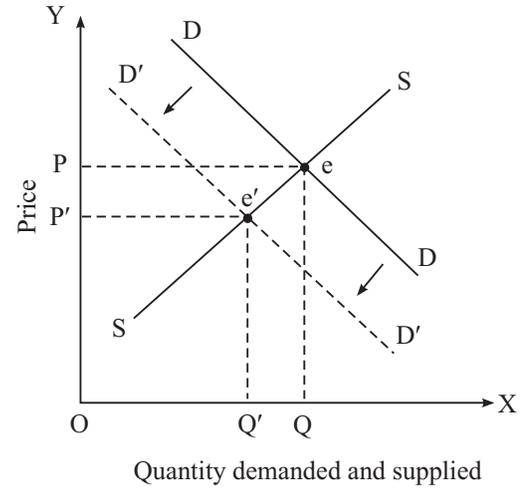
Fig. 22.6

22.6 EFFECT OF CHANGE IN SUPPLY ON EQUILIBRIUM PRICE AND QUANTITY

In this case, we will show the impact of change in supply of the commodity while demand for it remains the same.

(i) Effect of Increase in Supply

When due to any external factor such as a bumper crop, supply of a commodity increases (for every price level), the supply curve shifts rightwards. As a result, it now intersects the demand curve at a new, lower level, which causes the price to fall. As shown in the figure 24.9, demand curve DD intersects the initial supply curve SS at point e.
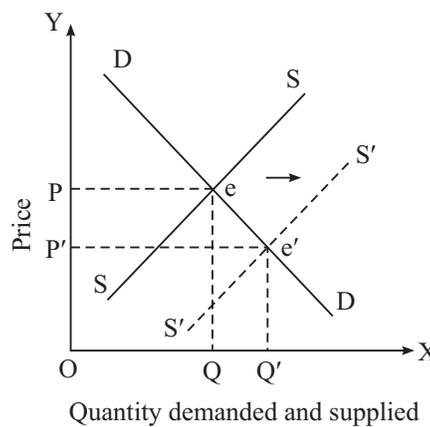
Quantity demanded and supplied

**Fig. 22.7**

The equilibrium price is OP and the equilibrium quantity demanded and supplied are OQ. Now, suppose, supply increases and as a result, supply curve shifts rightwards. This new supply curve S'S' intersects demand curve DD at point e'. So, the new equilibrium price is OP' which is higher than the earlier price OP. It may also be noted that the equilibrium quantity demanded and supplied have fallen from OQ to OQ'.

Notes

(ii) Effect of Decrease in Supply

When due to any external event such as paucity of raw material or say, floods or drought, supply for a commodity falls, the supply curve shifts leftwards. So, this new supply curve intersects demand curve at a higher level which causes the price to rise. As shown in the figure 22.10 demand curve DD intersects the initial supply curve SS at point e.

Quantity demanded and supplied
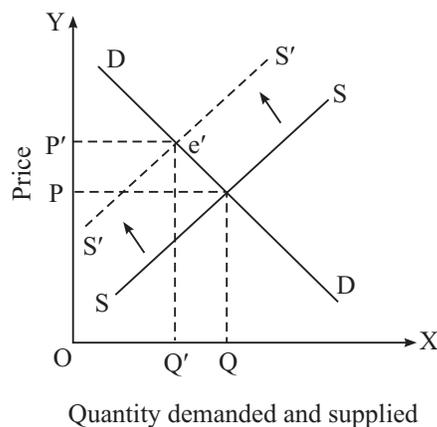
Fig. 22.8

The equilibrium price is OP and the equilibrium quantity demanded and supplied are OQ. Now, suppose supply decreases and as a result, supply curve shifts leftwards. This new supply curve S'S' intersects the demand curve DD at point e'. So the new equilibrium price is OP' which is higher than the earlier price OP. It may also be noted that the equilibrium quantity demanded and supplied have also decreased from OQ to OQ'.

22.7 EFFECT OF SIMULTANEOUS CHANGE IN DEMAND AND SUPPLY ON EQUILIBRIUM PRICE AND QUANTITY

Effect of any change in demand and supply will lead to a resultant change on equilibrium price. The direction of change in price will depend on relative strength

of change in demand and supply. For example, if both supply and demand increase and increase in demand is greater than increase in supply, price will rise. Any kind of change in demand and supply and their effect on price can be shown by drawing relevant demand and supply curves. A few cases are given here.

Increase in Both Demand and Supply

The three possible cases when both demand and supply are increasing can be explained as follows:

(a) Increase in Demand = Increase in Supply

The upward effect of increase in demand on price equals downward effect of increase in supply. As both the forces are equal in magnitude, price level remains the same. This is shown in the figure 22.11.
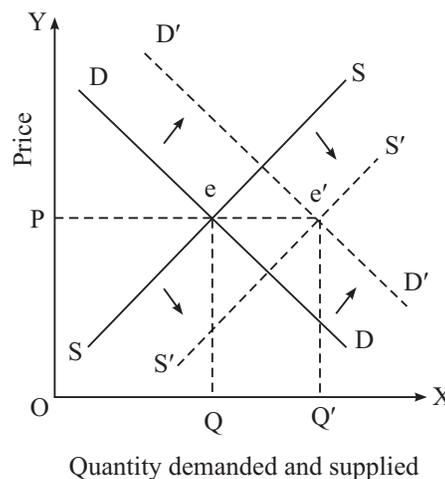
Fig. 22.9

(b) Increase in Demand > Increase in Supply

As in this case, the upward effect of increase in demand on price is greater than that of downward effect of increase in supply. As a result, price level rises. This is shown in the figure 22.12.

Quantity demanded and supplied
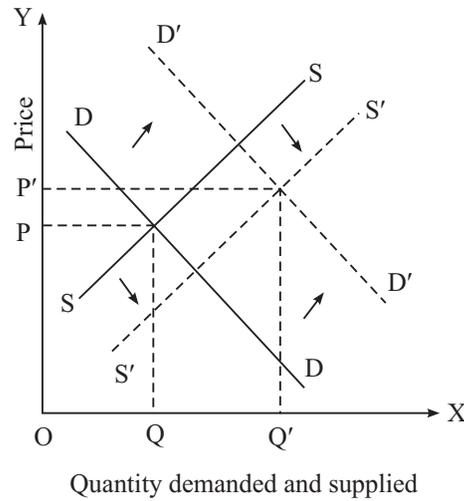
Fig. 22.10

(c) Increase in Demand < Increase in Supply

In this case, the upward effect of increase in demand on price is less than that of downward effect of increase in supply. As a result, price level falls. This is shown in the figure 22.13.

Quantity demanded and supplied
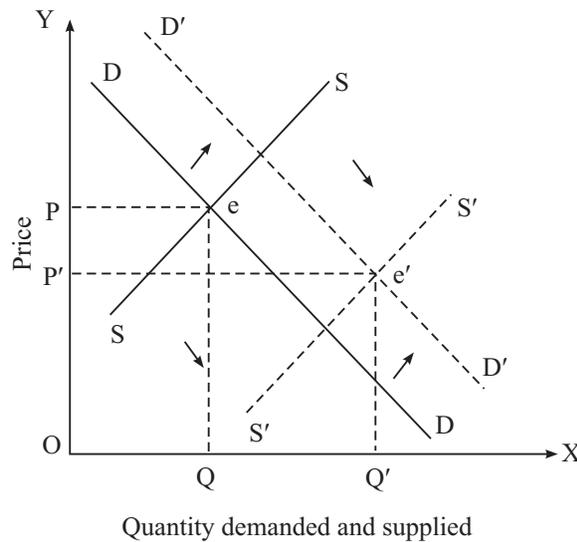
Fig. 22.11

Some other Cases

Similarly, we may conceive of many more other cases of change in demand and supply. A simultaneous decrease in both of them with three possibilities as described above or decrease in one of them and increase in the other again the magnitude of decrease or increase affecting the price and quantities change in demand and supply

Notes

Notes

with their different elasticities and so on. The possibilities may be numerous but the method to arrive at the equilibrium price remains essentially the same.

INTEXT QUESTIONS 22.3

1. With the help of diagrams, show the effect of increase and decrease in demand on price when supply remains constant.

2. With the help of diagrams, show the effect of increase and decrease in supply on price when demand remains constant.

3. Show the effect of increase in supply on price of a commodity when its demand is perfectly elastic.

4. Show the effect of simultaneous decrease in demand and supply on price when supply changes relatively to a greater extent.

22.8 SIMPLE APPLICATION OF DEMAND AND SUPPLY ANALYSIS

Determination of equilibrium price finds many applications in daily life and has implications for formulation of policies by the government. For example, formation of policies regarding floor price and ceiling price can be explained with the help of equilibrium price.

(a) Ceiling price: When the price prevailing in the market is too high and is affecting the interests of the consumers adversely, the government has to step in and decide ceiling price. The sellers are not allowed to raise price of their products beyond this ceiling price and thus the interests of the consumers are protected. An example of this may be rent control policy. Suppose the current rent for a particular type of flats is determined at OP which is exorbitant. In such a case, the government can fix the rent arbitrarily at OPc which is lower then OP and will give some relief to tenants (consumers). It may be mentioned that at this controlled rent OPc, the demand for flats (OQ_{DC}) exceeds supply of flats (OQ_{SC}) and this may lead to unscrupulous practices for which the government may have to take preventive and remedial measures. It may also be mentioned that fixation of price at a level above OP has no point as price mechanism will automatically push the price level back to OP.
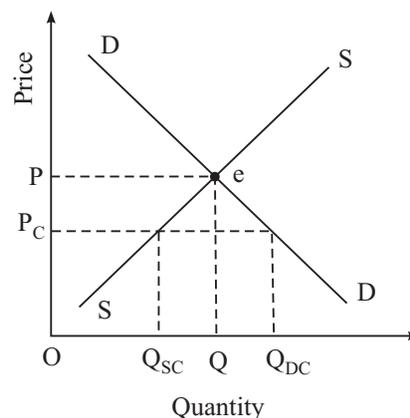
(b) Floor Price: It is not necessary that price determined is always too high. Sometimes it may be too low also. It may happen especially in markets with excessive supply of something. For example, Indian labour market is a market with excessive supply of labour. In such a setting, the wage rate determined by the market forces of demand and supply is generally too low (especially in the market for unskilled labour). To protect workers' interests in such a case the government may pass minimum wage legislation. Suppose, the wage rate prevailing in the market is OW which is too low. The government may pass minimum wage legislation and fix minimum wages at OW_F. This minimum wage level is floor price. The government does not allow the price level to go lower than floor price and thus sellers' interests are protected. (worker is the seller of his labour).
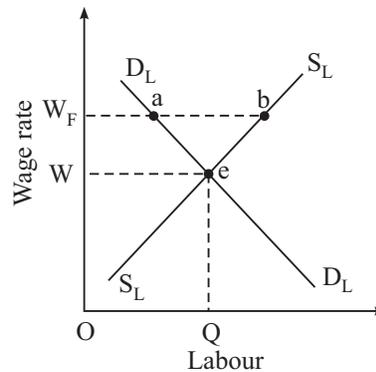
INTEXT QUESTIONS 22.4

1. What is ceiling price?
2. What is floor price?
3. What is the need for minimum wage legislation?
4. Explain ceiling price with the help of graph.
5. Define equilibrium price?

WHAT YOU HAVE LEARNT

- Equilibrium price is the price at which market demand for a commodity equals it market supply.

- Equilibrium price is determined by the interaction of the forces of demand and supply of a commodity. The point of intersection of demand curves and supply curve is called 'Equilibrium point' and the price and quantity determined at this point are called 'equilibrium price' and 'equilibrium quantity'.

- The property of flexibility ensures that any disequilibrium in demand and supply is self correcting through movement of price.

Notes

● Excess demand means more demand than supply at a given price.

● Excess supply means more supply than demand at a given price.

● With rise/fall in demand for a commodity, for a given supply both equilibrium price and quantity will rise/fall.

● With rise/fall in supply of a commodity for a given demand, both equilibrium price and quantity will fall/rise.

● When both demand and supply increase or decrease, their effect on equilibrium price and quantity depends on relative magnitude of change in demand and supply.

● Ceiling price is the price fixed below equilibrium price to protect consumers' interests. The government does not allow the price to mover above the ceiling price.

● Floor price is the price fixed above equilibrium price to protect sellers' interests. The government does not allow the price to fall below the floor price. Minimum wage legislation is an example.

TERMINAL EXERCISE

1. What is equilibrium price? Explain with the help of diagram.

2. What is excess demand? How is equilibrium between demand and supply restored in case of excess demand?

3. What is excess supply? How is equilibrium between demand and supply restored in case of excess supply?

4. Explain the effect of simultaneous increase in demand and increase in supply on equilibrium price and quantity. Use relevant diagrams.

5. Market demand and supply schedule of a commodity is given below:

Price (Rs per kg)	Quantity demanded (kg)	Quantity supplied (kg)
2	20	12
3	18	14
4	16	16
5	14	18
6	12	20

(i) What is the equilibrium price of the commodity?

(ii) What is the equilibrium quantity demanded and supplied at this price?

(iii) What happens if initial price is Rs 2 per kg?

(iv) What happens if initial price is Rs 6 per kg?

6. Explain the concept of ceiling price and floor price.

ANSWER TO INTEXT QUESTIONS

Notes

22.1

1. Refer to 22.1

2. Refer to 22.1

3. Refer to 22.2

4.   (i)   (d)

   (ii)   (d)

  (iii)   (c)

  (iv)   (d)

22.2

1. Refer to 22.3

2. Refer to 22.4

3. Refer to 22.3 (Process of Adjustment)

4. Refer to 22.4 (Process of Adjustment)

5. Refer to 22.3

6. Refer to 22.4

22.3

1. Refer to 22.5

2. Refer to 22.6

3.
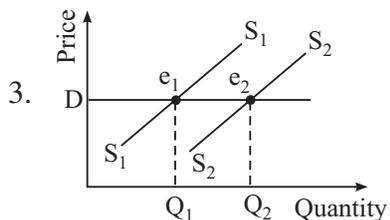
So price remains the same, whereas quantity rises.

4. As a result of shift in demand curve from D_1D_1 to D_2D_2 and supply curve from S_1S_1 to S_2S_2, the equilibrium point moves from e_1 to e_2. (Note that the magnitude of shift is greater for supply curve). consequently, equilibrium price increases from p_1 to p_2 which equilibrium quantity falls from Q_1 to Q_2.
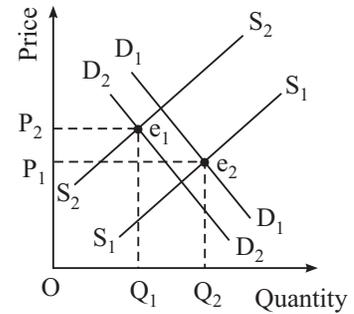
22.4

1. Refer to 22.8(a)
2. Refer to 22.8(b)
3. Refer to 22.8(b)
4. Refer to 22.8(a)

23

REVENUE AND PROFIT MAXIMIZATION OF A COMPETITIVE FIRM

Every producer/firm wants to get money by selling the product it has produced. Revenue or turnover is money that a firm/producer receives from its normal business activities, usually from the sale of goods and services to customers. The firm wants to recover its cost of production from the revenue it earns. In fact the firm wants to create simply of revenue over cost as well. How does a competitive firm achieve its goal of profit maximization is the topic of discussion here. The analysis is only meant for a competitive firm.

 OBJECTIVES

After completing this lesson, you will be able to:

● understand the concept of total revenue (TR); average revenue (AR) and marginal revenue (MR);

● distinguish between super normal profit, normal profit, and loss; and

● explain producers equilibrium of a competitive firm by using TR and TC approach as well MR and MC approach.

23.1 CONCEPT OF REVENUE

Revenue (sometimes called sales) refers to all the money a Firm/producer takes in from doing what it does – whether making goods or providing services. Total revenue of a firm is defined as the total sales proceeds in the market. The firm sales different quantities of the product to its customers at the prevailing market price. So the total revenue can be calculated by multiplying price with quantity. Symbolically

$$TR = PXQ$$

where   TR = Total revenue

  P = Price

  Q = Quantity.

Average Revenue (AR)

AR is defined as the ratio of total revenue to quantity of the product. Symbolically,

$$AR = \frac{TR}{Q}$$

Put $TR = P \times Q$

i.e. $AR = \frac{P \times Q}{Q}$

or $AR = P$

Average revenue is also known as the price of the product. In other words AR is the revenue per unit of the product sold by the firm.

Marginal revenue (MR)

Marginal revenue is defined as the increase in the total revenue due to an extra unit of the commodity sold by the firm in the market. In other worlds *MR* is the addition to *TR* as a result of the additional unit of the good sold. Symbolically,

$$MR = \frac{\Delta TR}{\Delta Q}$$

where Δ stands for change in.

Under perfect competition (refer to Lesson 22- "Forms of Market"), the price of the product is given as the product is homogeneous. So the *TR* of a firm can increase or decrease depending on the quantity it sells. If the quantity decreases *TR* will decrease and if quantity increases *TR* will also increase. See the Table below to know the behaviour of *TR* of a firm under perfect competition.

Table 23.1: TR, AR and MR of a competitive Firm

Price	Quantity	*TR*	*MR*	*AR*
10	0	0	0	0
10	1	10	10	10
10	2	20	10	10
10	3	30	10	10
10	4	40	10	10

Notes

As given in the table the price of the commodity is given at ` 10. It remains at 10 whatever quantity is sold. Now when quantity is 1, TR = 10 × 1 = 10. When quantity increase to 2, TR = 10 × 2 = 20. When quantity further increases to 3 and 4, TR increases to 30 and 40 respectively. This shows that under perfect competition, the total revenue of a firm increases due to increase in quantity given the price of the commodity in the market. Similarly, in the reverse way, if quantity falls from 4 to 3 *TR* decreases from 40 to 30 and so on.

Another point to be learnt about *TR* is that, it increases at a constant rate. Starting from 10, *TR* increases to 20, 30, 40 at a constant rate of 10 given the price and increase in each unit of quantity.

Coming to AR, since $AR = \dfrac{TR}{Q}$ or price, you may club them as a single column in the table instead of showing them separately. We have only given them in this table for the purpose of calculating AR and to show that it is same as price.

In the table, you can see that MR is also 10 at each point. In the beginning, MR is shown as 10 and TR = 10. It means that TR has increased form 0 to 10 when quantity has increased from 0 to 1. When quantity increases from 1 to 2, TR increase from 10 to 20. So $\Delta TR = 20 - 10 = 10 = 10$ and $\Delta Q = 2 - 1 = 1$. So MR at the 2nd quantity or 2nd unit of the commodity is given as $\dfrac{\Delta TR}{\Delta Q} =$

$\dfrac{20-10}{2-1} = \dfrac{10}{1} = 10.$ Similarly when quantity increases from 2 to 3, *TR* increases

from 20 to 30. So *MR* at 3rd unit of the good is given as $\dfrac{30-20}{3-2} = \dfrac{10}{1} = 10.$ and

so on. *MR* shows the manner is which *TR* is increasing as a result of one unit increase in the quantity of the good. So *MR* in measured between two quantities.

Relationship between AR and MR and TR

From the table above we can easily state the relationship between *AR*, *MR* and *TR* of the firm under perfect competition as follows.

1. Since price or AR is given under perfect competition and is constant through out, AR and MR are always equal. i.e. AR = MR for competitive firm.

2. Between MR and TR, it can be said that MR is the rate of change of TR. In other words, the value of MR at any quantity gives the value at which TR has increased above its previous unit.

Diagrammatic Presentation

We can give the diagrams of *TR*, *AR* and *MR* as given in Fig. 23.1 below.

Take, *TR* first. In order to draw the diagram of *TR*, take the values of *TR* (as given the table) on the vertical axis and the different values of quantity (Q) on the horizontal axis. Plot each combination of *Q* and *TR* and join these combinations to get *TR* curve. Here *TR* is a straight line through the origin as shown in the diagram.
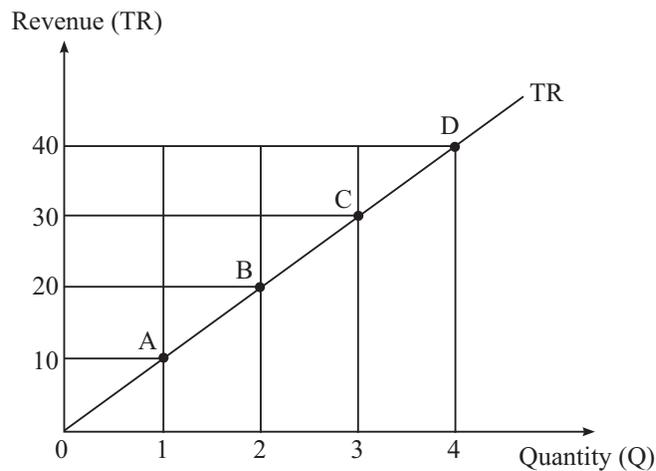
Fig. 23.1

As given in the diagram, the combination of Q = 1 and TR = 10 is plotted at point A. Point B shows Q = 2, TR = 20, point C shows Q = 3, TR = 30 and point D shows Q = 4 and TR = 40. Join 0, A, B, C and D to get TR.

The diagram for AR and MR for a firm under perfect competition is a horizontal line as shown in the diagram Fig. 23.2 below.
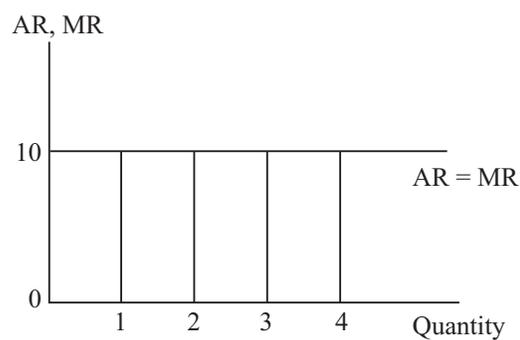
Fig. 23.2

In the table it is given that AR = MR = 10 at each quantity sold. So AR and MR start from 10 on the vertical axis which measures them. Then it becomes a horizontal line as there is no change in AR and MR with increase in quantity.

INTEXT QUESTIONS 23.1

1. Define TR, AR and MR symbolically.

2. If price is `5 and quantity sold increases from 6 to 7, find out TR, AR and MR?

    Where P = price, Q = Quantity,

        Δ = increase in.

23.2 VARIOUS CONCEPTS OF PROFIT

Profit is defined as the difference of total revenue (TR) over total cost (TC) of the firm.

So profit = TR – TC. Economists often distinguish between super normal profit and normal profit. Super normal profit is defined as the surplus of total, revenue over total cost. This means total revenue is greater that total cost. In order words if the difference between total revenue and total cost is positive or greater than zero, then we can say that the firm is earning super normal profit.

Example: A firm sells 5 units of a good at price 10. Its total cost of production is 40. Does supernormal profit exist, and how much?

Ans:
$$TR = 5 \times 10 = 50$$
$$TC = 40$$
$$TR - TC = 50 - 40 = 10$$

Since 10 > 0 i.e. TR – TC is positive, there is super normal profit which is equal to 10.

If we want to find out whether super normal profit exists at each unit of the output or at each quantity of the output then we must compare revenue and cost at each quantity.

You know that revenue per unit of the good is called average revenue (AR).

Similarly, cost per unit of the good is called average cost (AC). If $AR - AC$ is positive or AR > AC then there will be super normal profit. You can use price instead of AR also.

Normal profit

When total revenue equals total cost, the difference between them becomes zero. Such a situation is called normal profit or zero profit. So normal profit means

$$TR - TC = 0 \text{ or } TR = TC.$$

This also means that *AR* or *P* equals *AC* if we divide quantity. i.e. $\dfrac{TR}{Q} = \dfrac{TC}{Q}$.

or $\quad AR = AC$

Loss

When the firm's total cost exceeds total revenue , i.e. TC > TR the firm incurs loss. In other words loss of the firm implies that its TR is less than TC. At the unit level, loss means AR or P is less than AC (AR < AC). In a situation of loss the firm is not able to recover its cost of production after selling the product.

INTEXT QUESTIONS 23.2

1. The average cost of a firm is 10. It sold 10 units at a price of 10. What type of profit did the firm earn?

2. If TR > TC, then there is normal profit. True of false

3. If TR = TC, then there is super normal profit. True or false.

4. If AR < AC, then there is loss. True or false

23.3 PROFIT MAXIMIZATION OF A COMPETITIVE FIRM

The major objective of a firm is to maximize profit. To attain this we can explain two different approaches.

1. TR and TC approach

2. MR and MC approach

TR and TC approach

As we know that profit is the difference between total revenue and total cost, profit maximization through this approach states that the firm should produce that quantity of output at which the difference between total revenue and total cost is the maximum (*TR – TC* is maximum).

This can be explained by using the following table. [Recall the lesson on cost you have studied earlier).

Table 23.2: Profit maximization of a firm: TR and TC approach

Q	TR	TC	TR–TC = Profit
1	10	15	–5
2	20	20	0
3	30	22	8
4	40	25	15 (TR – TC is maximum.)
5	50	40	10
6	60	60	0
7	70	85	–15

Notes

As shown in the table, the TR of a competitive firm is increasing at a constant rate of 10. It starts from 0 when quantity is 0, Then with in each unit increase in the quantity TR is increasing by 10 i.e. when Q = 1, TR = 10.

When Q = 2, TR = 20 and so on. On the otherhand TC of the firm is 15 even if Q = 0. This is because of presence of fixed cost as already told in the lesson on cost. TC slowly increases in the beginning and then increases fast with increase in quantity of output. At Q = 1, TC = 15, then at Q = 2, TC = 20 which is an increase of 5. When Q = 3, TC = 22 which is an increase of 2 i.e. less than the previous unit. After this TC increases faster which you can easily verify.

Now look at the column on profit, marked as TR – TC. At Q = 1, TR –TC = – 5. This means that there is loss at this level of output because TC > TR. So the firm must increase output. At Q = 2, TR = TC so that TR – TC = 0. Here the firm is able to recover the cost. At Q = 3, TR = TC = 8 and at Q = 4, TR –TC = 15. At Q = 5, TR – TC = 10 which has fallen from the previous level of 15. At Q = 6, TR – TC falls to 0 and then at Q = 7, TR – TC is again negative at – 15 indicating loss. From this it is clear that at Q = 4, TR – TC is maximum at 15. So firm must produce 4 units to maximize profit because here the difference between *TR* and *TC* is maximum.

Diagrammatic Presentation

We can show the profit maximization process in a suitable diagram given as fig. 23.3.

Notes

Revenue TR
and cost (TC)
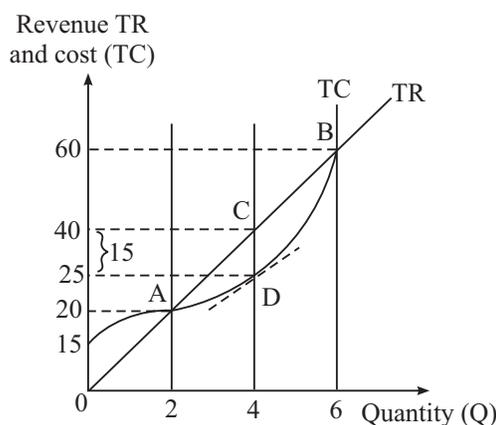
Fig. 23.3

In the diagram revenue and cost are measured on vertical axis. Quantity measured on horizontations. The TR is a straight line through the origin.

The *TC* curve starts from 15 on vertical axis and then rises like an inverse 'S' shaped curve as shown in the lesson on cost. From quantity 0 to 1 there is loss as $TC > TR$ here. At $Q = 2$, $TR = TC$. This is shown as *TR* and *TC* curves meeting at point A. At $Q = 4$, $TR = 40$, (which corresponds to) point *C* on TR curve. At the same level of Q = 4, point *C* and *TC* is 25, corresponding HO at point *D*. The distance *CD* is the maximum difference between *TR* and *TC*. Then at $Q = 6$, $TR = TC$ again and after that *TC* curve is above *TR* curve indicating loss. So at $Q = 4$, profit is maximized.

According to this Method, the profits of a firm can be estimated by calculating Margineal Revenue (It is the change in total Revenues by selling of additional Unit of Output) and Marginal cost (it is the addition to the total cost/Total variable cost by producing oe additional unit of Output) at difficult levels of Output the profit of a firm will be maximum at that level of output which MC is equal to MR.

$$MC = MR$$

or $$MR - MC = 0$$

MR and MC Equality approach to firms Equilibrium is bend on In (two) condtions.

(a) First order necessary condition. The Firm's MC must be equal to its MR at the equilibrium level of Output.

(b) Second order or sufficient conditioin. At the equilibrium level of Output the MC should be using i.e. the MC curve should have positive slope or MC curve intersects MR curve from below.

Table 23.3: Profit maximization through MC and MR Approach

Q	MR	MC	MR – MC	Total
1	5	8	–3	–0 loss
2	5	5	0	0
3	5	2	3	0
4	5	3	2	5 Profit
5	5	4	1	6
16	5	5	–0	
7	5	7	–2	0 loss

Notes

In the table quantity Q is increasing from 1 to 7. Marginal revenue (MR) is constant at 5 since the firm is under perfect competition (already told in the section on revenue). The marginal cost (MC) starts at 8 and then falls and increases to 5 and continues falling to 4 at Q = 5. After that MC rises to 5 at Q = 6 and then further rises to 7 at Q = 7.

From the behaviour of MR and MC, you can see that initially between Q = 0 to 1, MC > MR. As MC = 8 and MR = 5. At Q = 1, MC = MR = 5. Then between Q = 2 to Q = 6 MC lies below MR. Then again at Q = 6, MC rises to be equal to MR at 5. We can say that initially when MC > MR there is loss. So the firm must increase output. Then when MC = MR at Q = 2 there was no profit and no loss. But after that between Q = 3 to Q = 5, MC lies below MR. This is the zone of profit. For example at Q = 3, MR – MC = 5 – 2 = 3. At Q = 4, MR – MC = 5 – 3 = 2. At Q = 5, MR – MC = 5 – 4 = 1. At Q = 6, MR – MC = 5 – 5 = 0. i.e. We can say that profit starts at from 0 at Q = 2 to 3 at Q = 3, 2 at Q = 4, 1 at Q = 5 and 0 at Q = 6. Adding all these we get total profit to be 0 + 3 + 2 + 1+ 0 = 6, when Q = 6. After that at Q = 7, there is loss again. So profit is maximized at Q = 6. In the table it is clearly shown that MR = MC at two points, one when Q = 2 and then when Q = 6. However at Q = 2, profit was not maximum as the firm had loss earlier at Q = 1 with MC more than MR at the time. But at Q = 6, MC = MR, but total profit is already maximum as indicated by the fact that MC was less than MR when they become equal. Also after that MC exceeds MR creating loss. Hence at Q = 6, both the conditions of profit maximization are satisfied.

Notes

Diagrammatic presentation

The above table can be presented diagrammatically in fig. 23.4.
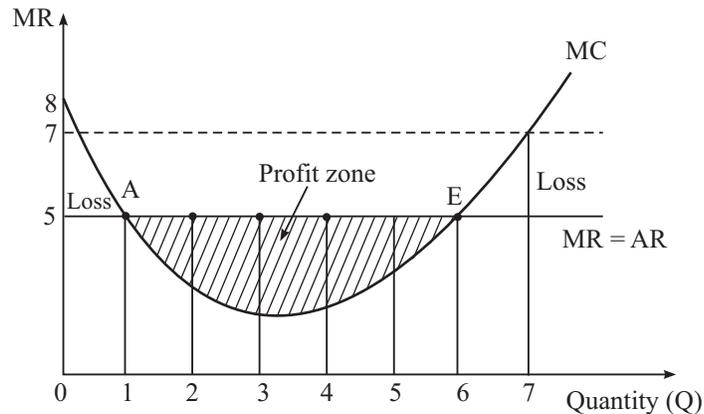
Fig. 23.4

In the diagram MR and MC are measured on vertical axis. Quantity is measured on horizontal axis. MR is horizontal at S. It is also same as AR as said earlier. MC is a 'u' shaped curve starting from see that initially when Q = 1, MC is above MR indication loss. Other MC Q = Z, MC = MR, at point A. Here MC units MR from above. MC lies below MR so profit stands from point A when Q = 2. Profits are napped as long as MC is less than MR and till they are equal at point when Q = 6. At point, E, MC = MR and MC is less than MR when they become equal. Diagrammatically it means that MC cuts MR from below. So "E" is the point of profit maximization which satisfies both the conditions.

INTEXT QUESTIONS 23.3

1. Maximum profit implies that *MC* is above *MR* after both are equal.

   True or false.

2. At quantity 2, *TR* = *TC*. After that *TC* lies below *TR* and again they become equal at quantity. 6. Do you firm agree that profit maximizing output lies between these two quantities. Yes/No.

WHAT YOU HAVE LEARNT

● Total revenue (*TR*) is the total sales proceeds of the firm. *TR* = Price × Quantity.

- $AR = \dfrac{TR}{Q}$ and $MR = \dfrac{\Delta TR}{\Delta Q}$.

- *AR* and *MR* are equal under perfect competition.

- Super normal profit refers to a situation when $TR > TC$ or $AR > AC$.

- Normal profit implies that $TR = TC$ or $AR - AC$. It is also called zero profit.

- Loss implies that $TR < TC$ or $AR < AC$.

- Profit maximizing output is that output where $TR - TC$ is maximum as per *TR* and *TC* approach.

- As per *MR* and *MC* approach, profit maximizing condition are

  (i) $MC = MR$

  (ii) *MC* must be less than *MR* before they are equal.

TERMINAL EXERCISE

1. Define total revenue, average revenue and marginal revenue. Give their relationship.

2. Fill TR, AR and MR column.

P	Q	TR	AR	MR
20	4			
20	5			
20	6			

3. Distinguish between super normal and normal profit.

4. Write a short note on loss of a firm by giving numerical example?

5. Explain the profit maximization principle by using TR and TC approach. Give suitable diagram.

6. Explain profit maximization conditions of a competitive firm by using suitable diagram?

7. Construct an imaginary table show the profit maximization output by using TR and TC approach?

8. Construct an imaginary shown the profit maximizing output of a competitive firm by using *MR* and *MC* approach?

ANSWERS TO INTEXT QUESTIONS

23.1

1. $TR = P \times Q$, $AR = \dfrac{TR}{Q}$, $MR = \dfrac{\Delta TR}{\Delta Q}$

2.

P	Q	TR	AR	MR
5	6	30	5	5
5	7	35	5	5

23.2

1. Normal profit or zero profit.
2. False
3. False
4. True.

23.3

1. True
2. Yes.

MODULE - IX
NATIONAL INCOME ACCOUNTING

Notes

24

NATIONAL INCOME AND RELATED AGGREGATES

The main objective of an economy is to provide goods and services for the satisfaction of different types of wants of the people. This objective is achieved through production process. During production process, income is generated in the economy.

Most of you must have heard or read about national income. It consists of two words national and income. Each of these words has specific meaning in economics. In this lesson, you will learn about the meaning of income, national income, and some basic concepts of national income. Without knowing these concepts it is very difficult to understand the meaning and the ways of measuring national income.

OBJECTIVES

After completing this lesson, you will be able to:

● make a distinction between factor incomes and non-factor incomes;

● understand the circular flow of income;

● know about basic economic activities;

● make distinction between closed the open economy;

● understand the concepts of stock and flow;

● understand the concept of domestic territory and normal residents of a country;

● distinguish between intermediate products and final products, value of output and value added, gross and net measures of value added;

- explain different types of factor incomes;

- understand the concepts of domestic product and national products;

- explain the concepts of nominal and real GDP; and

- understand the concepts of GDP, NDP, GNP and NNP at market price and factor cost.

24.1 MEANING OF INCOME

In the economy we receive different types of incomes. We receive wages and salaries from our employers. We receive interest on capital for lending money. We also receive gifts and donations from others without giving anything in return. All these incomes can be grouped into two types of incomes.

(A) Factor incomes

(B) Non-factor incomes

(A) Factor incomes

A factor income is the income accruing to a factor of production in return for the services rendered to the production unit. We know that production is result of the joint efforts of the four factors of production. These four factors of production are:

(i) Labour

Labour includes all physical and mental efforts of human beings used for production of goods and services. These physical and mental efforts are inseparable. A worker requires both. Some of the jobs requires more of physical labour than mental labour and some jobs require more mental labour than physical labour.

The remuneration paid to the workers is popularly termed as wages and salaries. In national income accounting, it is termed as compensation of employees.

(ii) Land

By land in economics we mean all that is given to us free by nature, on, below or above the surface of the earth. On the surface it includes, surface area of the soil, water, forests etc. below the surface it includes mineral deposits, water streams, petroleum etc., and above the surface it includes the sun, light, wind etc.

As the land became scarce, sale and purchase of land started.

Those who owned land started charging price for the use of land. Such a payment to the land owner/landlord is termed as rent.

(iii) Capital

Capital includes all the man made resources used for producing goods and services like structures on land, machines, equipments, vehicles, stock of materials etc.

The payment made to the owner of capital for the use of capital is termed as interest.

(iv) Entrepreneurship

It refers to the initiative taken by a person or a group of persons in starting and organising a business. Unless somebody takes this initiative, no business can be started. The one who takes this initiative is termed as entrepreneur.

The income accruing to the entrepreneur is termed as profit.

Thus compensation of employees, rent, interest and profit are factor incomes of the factor owners.

(B) Non- factor incomes:

There are certain money receipts which do not involve any sacrifice on the part of their recipients, the examples are gifts, donation charities, taxes, fines etc. No production activity is involved in getting these incomes. These income are called transfer incomes because such income merely represent transfer of money without any good or service being provided in return for the receipts. These incomes are not included in national income.

24.2 BASIC ECONOMIC ACTIVITIES

Production consumption and investment are three basis economic activities that take place in every economy

(a) Production

Production is addition of value to an existing commodity. During production process already existing commodities are made more useful by combined efforts of factors of production which increase their value. This increase in value is known as production. Suppose, a carpenter purchase wood worth ₹ 1000/- and makes furniture from it sells it for ₹ 2000/- In this production process he has added value of ₹ 1000/- (₹ 2000-1000)

(b) Consumption

Using up of produced goods and services for the direct satisfaction of individual

Notes

and collective wants of the people is called consumption. It includes all goods and services purchased by households like food items, clothes shoes etc. and by the government for collective consumption like, roads, bridges, parks, schools etc.

Investment/Capital Formation

Investment is that part of production which is left after consumption and used for creating physical assets like machines, equipments, material etc. It is that part of production which is used for further production. It increases the future production capacity of the economy.

The three activities of production, consumption and investment are interrelated and interdependent. Increase in production, increases both consumption and investment. Increase in consumption induces the producers to produce more in future. Increase in investment increases the future production capacity of a country which increases both production and investment. With out production there can be neither consumption nor investment. These three economic activities are responsible for generating the income flows in the economy.

24.3 CLOSED ECONOMY VS OPEN ECONOMY

In modern age, nearby every country has some economic relations with other countries. All the countries buy goods and services from other countries. Borrowing and lending also takes place among different countries. The people of one country also visit other countries. If the two countries have economic relations with each other, the real and money flows also take place between them.

An open economy is a term used for a country which has economic relations with the rest of the world. Most of the countries of the world are open economies. The closed economy is the term used for a country which has no economic relations with the rest of the world. Such economies are rare in the present day world.

24.4 STOCK AND FLOW

The distinction between stock and flows is very significant for national income estimates.

Stock: A stock is a quantity which is measured at point of time i.e. at 4 p.m. on 31st March etc. wealth, population, money supply etc. are stock concepts. It has no time dimension.

Flow: A flows is a quantity which is measured over a period of time i.e. days, month, years etc. It has time dimension. National income, population growth are flow concepts.

Notes

24.5 CIRCULAR FLOW OF INCOME

Production, consumption and investment are important economic activities of an economy. In carrying out these economic activities, people make transactions between different sectors of the economy. Because of these transactions, income and expenditure move in circular form. This is called circular flow of income. It is based on two principles.

(i)   The expenditure of the buyer because the income of the sellers.

(ii)   Good and services flow in one direction from sellers the buyers while money payment for these goods, and services flow in opposite direction i.e. from buyers to sellers.

In this way, the flow of goods and services (real flow) and flow of money payments (money flow) together make a circular flow.

Real flow

Households render factor services as owners of land, labour, capital and entrepreneurship to firms. The firms produce good, and services to meet the demand of the households. Such flow of factor services from households to firms and flow of goods and services from firms to households is know as real flow.

Money flow

In modern economies, goods and services and factor services are valued is terms of money. Households receive rent for land, wages for labour, interest for capital and profit for entrepreneurship- from firms and make payment for goods and services supplies by firms. This flow of money between firms and households is called money flow:

Circular flow can be shown with the help of a diagram given below:

Circular flow of income in a two sector economy without savings.
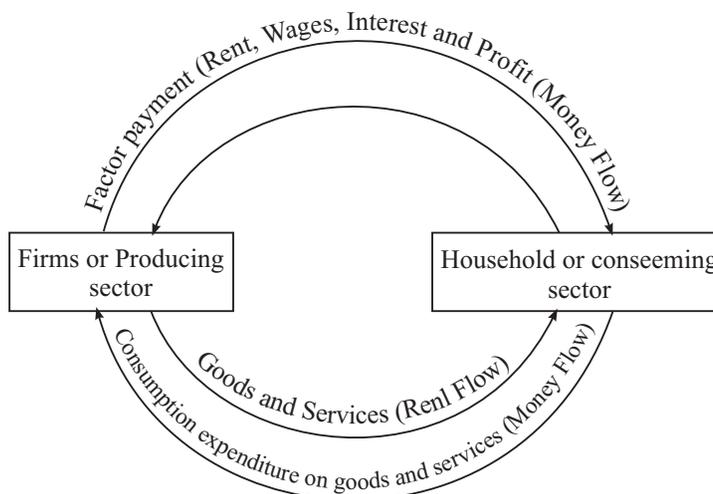
Fig. 24.1

Different sectors of the economy and their inflows and outflows.

An open economy can by divided into following five sectors:

(i)   Producing sector

(ii) Household sector

(iii) Government sector

(iv) Financial sector

(v)   Rest of the world sector.

The circular flow of income among these sectors can be shown with the help of a chart given below:
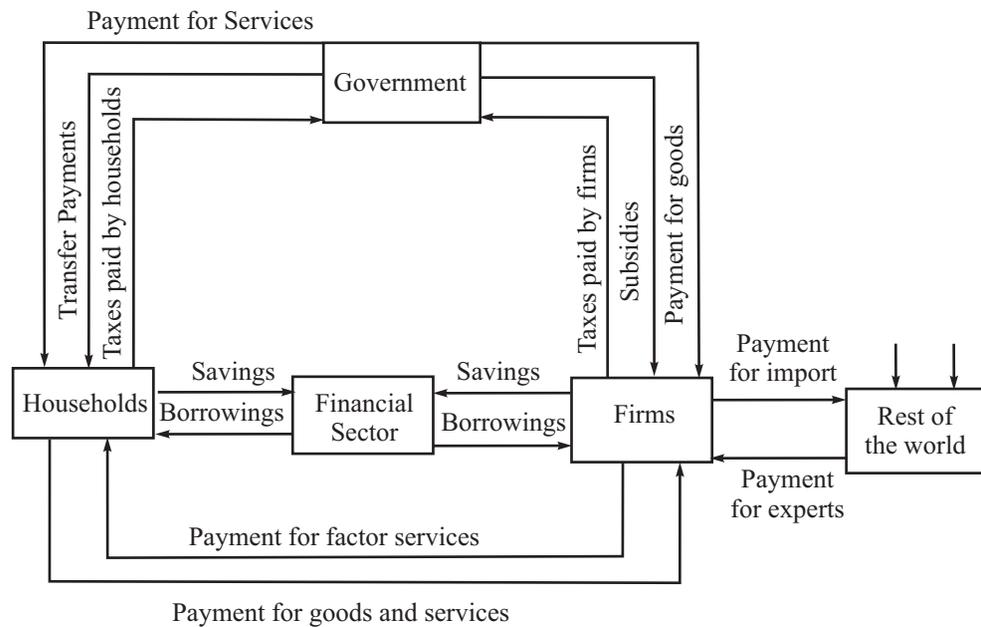
Fig. 24.2

1. Flows from and to the production units

(a) They buy factor services from households (real inflow). In return they make payment in the form of wages, vent, interest and profits (money out flows)

(b) They deposit savings in financial sector (money outflow)

(c) They deposit savings in financial sector (real inflow) and in return make payments for import. (money outflow)

(d) They export goods and services (real outflow) and in return they get payments for the exports (money outflow)

(e) They pay taxes to the government (money outflow)

(f) They sell goods and services to households and government. (real outflow). In return, they get payment from households, (private consumption expenditure) and general government (government consumption expenditure) (money inflow)

(g) They receive subsidies from government. (money inflow)

(h) They borrow from the financial sector (money inflow)

2. Flows from and to the households:

(a) They buy goods and services from the production unit (real inflow) and in return make payments in the form of consumption expenditure (money outflow)

(b) They pay personal taxes to the government (money outflow)

(c) They deposit savings in the financial sector (money outflow)

(d) They sell factor services to the enterprises (real flow) and in return get factor incomes (money inflow)

(e) They get free services (real inflow) and transfer payment (money inflow) from government.

3. Flows from and to government

(a) It purchased goods and services from production units (real inflow) and in return makes payments i.e. government consumption expenditure (money outflow)

(b) It pays subsidies to the production units (money outflow)

(c) It provides free services to households (real outflow) and make transfer payments (money outflow)

(d) It deposits savings in the financial sector (money outflow)

(e) If receives taxes from production units (money inflow)

(f) It receives personal taxes from households (money inflow)

4. Flows from and to the financial sector

(a) It lends capital to the production units (money outflow)

(b) It receives savings from production units, households and government (money inflow)

5. Flows from and to the rest of the world

(a) Goods and services are imported from the rest of the world (real inflow) and in return payment are made (money outflow)

Notes

(b) Goods and service are exported to rest of the world (real outflow) and in return payment are received (money inflow)

Not all the flows influence the generation of national income. Some of these are non-factor or transfer incomes flows and have no effect on national income. The significance of the distinction between the two types of flows will become more clear when you will study lesson no. 25.

INTEXT QUESTIONS 24.1

(i) Name four factor of incomes.

(ii) What are transfer payments?

(iii) What is a closed economy?

(iv) Give any two examples each of stock and flow.

24.6 CONCEPTS RELATED TO NATIONAL INCOME

To understand the meaning of national income it is essential to understand some basic concepts related to national income and its related aggregates. These concepts are

24.7 DOMESTIC TERRITORY

The concept of domestic territory (Economic territory) is different from the geographical or political territory of a country. Domestic territory of a country includes the following

(i) Political frontiers of the country including its territorial waters.

(ii) Ships, and aircrafts operated by the normal residents of the country between two or more countries for example, Air India's services between different countries.

(iii) Fishing vessels, oil and natural gas rigs and floating platforms operated by the residents of the country in the international waters or engaged in extraction in areas where the country has exclusive rights of operation.

(iv) Embassies, consulates and military establishments of the country located in other countries, for example, Indian embassy in U.S.A., Japan etc. It excludes all embassies, consulates and military establishments of other countries and offices of international organisations located in India.

Thus, domestic territory may be defined as the political frontiers of the country including its territorial waters, ships, aircrafts, fishing vessels operated by the normal residents of the country, embassies and consulates located abroad etc.

24.8 NORMAL RESIDENT

The term normal resident is different from the term nationals (citizens). A normal resident is a person who ordinarily resides in a country and whose centre of economic interest also lies in that particular country. Normal residents include both nationals (such as Indians living in India) and foreigners (non-nationals living in India). For example, Nepalese living in India for more than one year and performing economic activities of production, consumption and investment in India, will be treated as normal residents of India.

On the contrary, Indian citizens, living abroad (say in USA) for more than one year and performing their basic economic activities there, will be treated as normal resident of that country where they normally reside. They will be considered as non-residents of India (NRIs).

24.9 INTERMEDIATE GOODS AND FINAL GOODS

To understand the concept of national income and its related aggregates it is necessary to understand the meaning and difference between intermediate goods and final goods.

(i) Intermediate Goods : Intermediate goods are those goods which are meant either for reprocessing or for resale. Goods used in the production process during an accounting year are known as intermediate goods. These are non-durable goods and services used by the producers such as raw materials, oil, electricity, coal, fuel etc. and services of hired engineers and technicians etc. Goods which are purchased for resale are also treated as intermediate goods. For example, Rice, wheat, sugar etc. purchased by a retailer/wholeseller.

(ii) Final Goods : Goods which are used either for final consumption by the consumers or for investment by the producers are known as final goods. These goods do not pass through production process and are not used for resale. For example, bread, butter, biscuits etc. used by the consumer.

Whether a good is a final good or an intermediate good depends on its use. For example; milk used by a sweet maker is an intermediate good but when it is used by the consumer it becomes a final good.

Intermediate goods are not included in the calculation of national income. Only final goods are included in the calculation of national income because value of intermediate goods is included in the value of final .goods. If it is included in national income it will lead to the problem of double counting.

Notes

24.10 VALUE OF OUTPUT AND VALUE ADDED

(i) Value of Output : Production units use non-factor inputs like raw materials (intermediate goods) and factor inputs (factors of production i.e. land, labour, capital and entrepreneurship) for production. Various firms and production units produce different types of-goods. Money value of all goods and services produced is known as value of output. (It means value of output includes value of intermediate goods also).

Thus;

<p align="center">**Value of output = Quantity × Price**</p>

Producing units sell their output in the market. However, it is not necessary that the whole of the output produced during an accounting year is sold during that very year. Therefore, the unsold produce forms a part or the stock or inventories. So, change in stock or inventories is also a part of value of output. Thus, value of output can also be measured as

<p align="center">**Value of output = Sales + change in stock**</p>

It is clear that value of output includes value of intermediate consumption also. National income does not include intermediate consumption expenditure. So for calculation of National Income it must be deducted from value of output to avoid the problem of double counting.

(ii) Value Added : After deducting value of intermediate goods from value of output we get value added. So, value added is the difference between value of output and intermediate consumption expenditure.

<p align="center">**Value Added = Value of output - Intermediate Consumption Expenditure**</p>

The concept of value of output and Value Added can be explained with the help of an example. Suppose a farmer produces cotton worth ₹ 500 and sells it to the cloth mill. The cloth mill produces cloth worth ₹ 1,500. (Say produces 300 metres of cloth and market price of cloth is ₹ 5 per metre). But in this value, value of cotton is~ also included and cotton used by cloth mill is an intermediate good so value of cotton i.e. ₹ 500 will be intermediate cost. Therefore value added will be ₹ 1000/-

<p align="center">**₹ 1500 – ₹ 500 = ₹ 1,000/-**</p>

Gross and Net Measure : The concept of 'Gross' and 'Net Measure' is very important for the calculation of national income. The value of output and value added calculated above is a gross measure because when goods are sold out in the market these include all type of costs. During production process fixed capital assets like machines, building etc. get depreciated and their value goes down. This

is known as normal wear and tear of machinery or consumption of fixed capital or depreciation. So every production unit makes provision for depreciation. When it is included in value, of output and value added, these are called Gross Value of output and Gross Value added respectively.

If depreciation is not included in value of output and value added these are called Net Value of output and net value added respectively.

Net Value of output = Gross Value of output – depreciation

Not Value of added = Gross Value of added – Depreciation

24.11 MARKET PRICE AND FACTOR COST

The buyers purchase goods from the market and the price paid by them is known as 'market price': The sellers pay a part of this price as 'indirect taxes' to the Government.

(i) **Indirect taxes** are those taxes which are levied by the government on sales and production and also on imports of the commodities in the form of sales tax, excise duties, custom duties etc. These taxes increase the market price of the commodities.

(ii) **Subsides :** Sometimes, Government gives financial help to the production units for selling their product at lower prices fixed by the government. Such help is given in case of those selected commodities whose production the Government wants to encourage. If we deduct these subsidies from indirect taxes, we get net indirect taxes.

(iii) **Net Indirect Taxes :** It is the difference between indirect tax and subsidy.

<p align="center">**Net Indirect Tax = Indirect Tax - Subsidy**</p>

Value Added at Market Price - Net Indirect Tax (NIT)

    = Value Added at Factor cost (FC)

Or   Value Added at MP - Indirect Tax + Subsidy

    = Value Added at FC

24.12 DOMESTIC INCOME VS NATIONAL INCOME

The sum total of value added by all production units within domestic territory of a country is called domestic product. Both residents and non-residents render factor services to these units. Therefore, the income generated in these units is shared by both the residents and non-residents as their factor income. To get contribution of only normal residents (or their factor income earned within the

domestic territory) we have to deduct the factor payments made to the non-residents. These factor payments are known as factor payments made to the rest of the world.

The residents, in addition to their factor services to the production units located in the economic territory of a country, also provide factor services to the production units outside the economic territory i.e., to the rest of the world (ROW). In return for these services they receive factor incomes from the rest of the world.

Thus, National income is the sum total of factor incomes earned by the normal residents of a country within and outside the economic territory. Therefore,

National Income = Domestic Income + Factor income received from ROW – Factor payments made to ROW.

Net Factor Income from ROW : It is the difference between factor income 's received from ROW and factor payments made to ROW.

National Income/Product = Domestic Income/product + Net factor income form abroad

Accordingly,

(i)   Gross Domestic Product at market price + Net factor income from abroad = Gross National Product at market price.

(ii) Net Domestic Product at market price + Net factor income from abroad = Net National Product at market price.

(iii) Net Domestic Product at Factor cost + Net factor income from abroad = Net National Product at factor cost.

It is Net National Product at factor cost which is called **National Income** of a country.

Nominal and Real GDP

When the money value of goods and services included in GDP is estimated on the prices of current year, it is called GDP at current prices or nominal GDP. Here current prices mean the prices of the year of which GDP is estimated. For example, for estimating GDP for the year 2012-13 if we use the prices prevailing in the year 2012-13, we shall get nominal GDP.

On the other hand, when the value of goods and services included in GDP is estimated on the prices of base year, we get GDP at constant prices or real GDP. Increase in real GDP implies increase in the production of goods and services. Therefore, the calculation of GDP at constant prices or real GDP gives us the correct picture of the economic performance of an economy.

INTEXT QUESTIONS 24.2

Choose the correct alternative

(i)   The term 'domestic' territory in national income is associated with:

    A.   Economic territory

    B.   Geographical territory

    C.   Residents

    D.   Citizens

(ii) By deducting intermediate consumption expenditure and net indirect taxes from the value of output we get

    A.   Gross value added at market price.

    B.   Gross value added at factor cost.

    C.   Net value added at market price.

    D.   Net value added at factor cost.

(iii) By deducting consumption of fixed capital and intermediate cost from the value of output we get:

    A.   Gross value added at market price.

    B.   Gross value added at factor cost.

    C.   Net value added at market price.

    D.   Net value added at factor cost.

(iv) Value added is a measure of the contribution of

    A.   a resident.

    B.   a production unit.

    C.   an entrepreneur.

    D.   a worker.

(v)   The expenditure on goods and services purchased for resale by a production unit is

    A.   Intermediate cost.

    B.   Value of final products.

    C.   Value of output.

    D.   Factor cost.

(vi) National income of a country is same as

    A.   Gross National Product at market price.

B.   Net National product at factor cost.

C.   Gross National Product at factor cost.

D.   Net National Product at market price.

(vii) The difference between domestic income and national income is of

A.   Net indirect taxes

B.   Net factor income from abroad

C.   Depreciation

D.   Intermediate consumption expenditure

24.9   NATIONAL INCOME AS AGGREGATE OF FACTOR INCOMES

A production unit is formed by the four factors of production, land, labour, capital and entrepreneurship. During production process they generate income. This generated income is known as Net Value Added at FC (NVA at FC). Net value added at factor cost is distributed among the owners of four factors of production in the form of following factor incomes.

(a) Compensation of employees

Compensation of employees includes all monetary and non-monetary benefits that accrue to the employees on account of labour services rendered by them in the production process. The employees get wages or salaries. In addition they may get many other benefits as employees like bonus, employer's contribution to provident fund, free accommodation, free conveyance, free medical facilities, free holiday trips, etc.

(b) Rent

It is a factor income earned from lending the services of buildings and subsoil assets for production of goods and services.

(c) Interest

Interest is the income earned by those who provide funds to the production units. Any interest payment against loans given to consumers to meet consumption expenditure is not a factor payment and so can not be treated as factor income.

(d) Profit

Profit is the income accruing to the entrepreneur for his entrepreneurial services (i.e. bearing risks and uncertainties in the business) to the production units. It is a

residual income left after making factor payments out of the value added in the form of compensation of employees, rent and interest.

(e) Mixed Income of self employed

Mixed income of self employed is the income generated by self employed persons like doctors, lawyers, farmers, shop keepers etc. A self employed person provide his labour as well as his property in his work and generally does not keep accounts in a manner so that the factor payments are clearly identified. For example, a small shopkeeper starts his business in his own house employing his own labour and capital. Hence, the income of this small shopkeeper will be termed as mixed income of self employed.

National Income as aggregate of factor incomes

National Income = Compensation of employes + Rent + Interest + profit + Mixed income + Net factor income from ROW.

or National Income = NDP at FC + Net Factor income from ROW.

24.10 NATIONAL INCOME AS AGGREGATE OF FINAL EXPENDITURE

Income generated during production process in the form of factor incomes is spent by the factor owners on final consumption and investment goods. All consumer goods are generally final goods. Durable producer's goods like machines and buildings which are used again and again in the production process are also final goods because they are not further sold.

Demand for final goods are made by all the three sections of the economy, namely households, firms and the government. The purchases for final consumption are made by the households and the government. The purchases for investment are made by the production units within the economic territory. Accordingly, the final expenditure is classified into

(a)   Private final consumption expenditure

(b)   Government final consumption expenditure

(c)   Investment Expenditure

(d)   Net exports.

(a) Private Final Consumption Expenditure

Private Final Consumption Expenditure includes purchases by the households and the non-profit institutions serving housholds. The households purchase goods and

services for satisfaction of wants of their family members. The non-profit institutions serving households consist of institutions like mosque, temples, churches, gurudwaras, charitable hospitals, etc. who provide goods and services to the households free of cost.

Final consumption Expenditure includes expenditure made by the households and non profit institutions on the purchase of the following items

(i)   Consumer non-durable goods like fruits, vegetables etc. These goods are used up in a single act of consumption.

(ii)   Consumer durable goods like washing machines, furniture etc. These goods are used for a longer period of time.

(iii) Consumer services like education facilities, transport facilities, doctor's services etc. All these services are consumed as soon as they are produced.

(b) Government Final Consumption Expenditure (GFCE)

Government Final Consumption Expenditure is the expenditure on the free services provided to the people by the government. The main examples of these services are that of police, military, educational institutions, hospitals, roads, bridges, legislatures and other government departments.

(c) Investment Expenditure

Expenditure incurred by production units on the purchase of physical assets such as machines, building etc. during an accounting year, is known as investment expenditure.

There are five categories of investment (Gross domestics capital formation). These are

(i)   **Gross Business fixed investments :** Business fixed investment is the amount spent by the business units on the purchase of new capital assets like plants, machinery, equipments etc. These are durable producers goods that is why we call these expenditures as a fixed investment. If we deduct depreciation from it will be net business fixed investment.

(ii)   **Inventory investment or stock investment :** Inventory investment includes net increase in the stock of raw materials, semi finished goods and finished goods with producers,. It is essential for continuous supply of goods and services by the producers.

(iii) **Residential construction investment :** The amount spent on the building of housing units is regarded as residential construction investment in national income accounting.

(iv) Public Investment : It includes all investment by the Government such as expenditure on building roads, hospitals, schools etc.

(v) Net exports: Exports refer to expenditure by foreigners on goods and services produced in our domestic territory whereas, imports refer to our expenditure on foreign Good and services. Net exports are a difference of exports and imports.

INTEXT QUESTIONS 24.3

Choose the correct alternative:

(i) Which of the following is not treated as compensation of employees?

    A. Payment of salary.

    B. Payment of bonus.

    C. Payment of travelling expenses on a business tour.

    D. Free accommodation..

(ii) Rent in national income estimates accrues to

    A. Land used for production.

    B. Structure erected on land used for production.

    C. Land and structure both used for production.

    D. Land and structure used for residence.

(iii) The GVA at MP exceeds NVA at MP by the amount of

    A. Indirect taxes

    B. Subsidies

    C. Consumption of fixed capital

    D. Net factor income from abroad.

(iv) National product exceeds domestic product by the amount of:

    A. Exports

    B. Factor income received less factor income paid to abroad

    C. Factor income received from abroad.

    D. Imports

(v) The final expenditure is the expenditure on :

    A. Consumption only.

    B. Investment only.

    C. Both consumption and investment.

D.   Neither on consumption nor on investment.

(vi) Domestic product at market price exceeds domestic product at factor cost by:

A.   Net factor income from abroad.

B.   Consumption of fixed capital.

C.   Net indirect taxes.

D.   Exports.

24.11 NATIONAL INCOME AND ITS RELATED AGGREGATES

After understanding the related concepts of national income you can easily understand the, meaning of national income and its related aggregates. The related aggregates of national income are

(i)   Gross Domestic Product at Market price (GDP_{MP})

(ii)   Gross Domestic Product at Factor Cost (GDP_{FC})

(iii) Net Domestic Product at Market Price (NDP_{MP})

(iv)   Net Domestic Product at FC or (NDP_{FC})

(v)   Net National Product at FC or National Income (NNP_{FC})

(vi)   Gross National Product at FC (GNP_{FC})

(vii) Net National. Product at MP (NNP_{MP})

(viii) Gross National Product at MP (GNP_{MP})

(i)   Gross Domestic Product at Market Price : It is the money value of all the final goods and services produced within the domestic territory of a country during an accounting year.

GDP_{MP} = Net domestic product at FC (NDP_{FC}) + Depreciation + Net Indirect tax.

(ii) Gross Domestic Product at FC : It is the value of all final goods and services produced within domestic territory of a country which does not include net indirect tax.

$GDP_{FC} = GDP_{MP}$ – Indirect tax + Subsidy

or $GDP_{FC} = GDP_{MP}$ – NIT

(iii) Net Domestic Product at Market Price : It is the money value of all final goods and services produced within domestic territory of a country during an accounting year and does not include depreciation.

$NDP_{MP} = GDP_{MP}$ – Depreciation

(iv) Net Domestic Product at FC : It is the value of all final goods and services which does not include depreciation charges and net indirect tax. Thus it is equal to the sum of all factor incomes (compensation of employees, rent, interest, profit and mixed income of self employed) generated in the domestic territory of the country.

NDP_{FC} = GDP at MP – Depreciation – Indirect tax + Subsidy

(v) Net National Product at FC (National Income) : It is the sum total of factor incomes (compensation of employees + rent + interest + profit) earned by normal residents of a country in an accounting year

or

NNP_{FC} = NDP_{FC} + Factor income earned by normal residents from ROW - factor payments made to ROW.

(vi) Gross National Product at FC = It is the sum total of factor incomes earned by normal residents of a country along with depreciation, during an accounting year.

GNP_{FC} = NNP_{FC} + Depreciation

(vii) Net National Product at MP : It is the sum total of factor incomes earned by the normal residents of a country during an accounting year including net indirect taxes.

NNP MP = NNP_{FC} + Indirect tax – Subsidy

(viii) Gross National Product at MP : It is the sum total of factor incomes earned by normal residents of a country during an accounting year including depreciation and net indirect taxes.

GNP_{MP} = NNP_{FC} + Dep + NIT

INTEXT QUESTIONS 24.4

Fill in the blanks with the help of the clues given below

Net Indirect Taxes, Subsides, Depreciation, Factor incomes earned by normal residents from ROW

(i) GDP_{MP} = NVA_{FC} + Depreciation + ...

(ii) NDP_{MP} = GDP_{MP} – ....

(iii) NNP_{FC} = NDP_{FC} + ... - Factor Payments made to ROW.

(iv) GDP_{FC} = GDP_{MP} - Indirect Taxes + ...

(v) NDP_{FC} = GDP_{MP} - Depreciation - ....

Notes

WHAT HAVE YOU LEARNT

● The term 'domestic' in domestic income is associated with 'economic territory'.

● The intermediate goods are those goods which are purchased by production units from other production units and are meant either for resale or for further production. Final goods are those goods which are acquired for final consumption and investment.

● During production process production units generate income known as net value added at factor cost.

● The excess of value of output over intermediate consumption is 'value added'

● Gross concept includes depreciation while net concept does not include it.

● GVA at MP = Value of output - Intermediate Cost.

● Net indirect taxes = Indirect Tax - Subsidy.

● NVA at MP = GVA at MP - Consumption of fixed Capital.

● NVA at FC = NVA at MP - indirect taxes + subsidies.

● The economic territory of a country is different from its geographical territory.

● Sum total of value added by all production units located in economic territory of a country is domestic product.

● Domestic product + net factor income received from abroad is national product.

● Net national product at factor cost is same as national income.

● The concept of resident is different from the concept of citizen.

● The factor incomes are : compensation of employees accruing to labour, rent to land owners, interest to capital owner and profits to entrepreneur. Mixed income is a mixture of factor incomes and it is difficult to allocate it among different factor incomes.

TERMINAL EXERCISE

1. Explain the concept of economic territory.

2. Explain the concept of residents.

3. Differentiate between intermediate products and final products? What is the significance of this distinction?

4. Explain the concept of value added by giving a numerical example.

5. The following information is given:

    (a) Value of output

    (b) Indirect taxes

(c)   Intermediate cost

(d)   Consumption of fixed capital.

(e)   Subsidies.

Derive the following measures of value added on the basis of the above information.

(i)   GVA at MP

(ii)   GVA at FC

(iii)   NVA at MP

(iv)   NVA at FC

6.   Name different factor incomes and explain briefly their meaning.

7.   What is 'mixed income'? Why is there a need for such concept?

8.   Name different type of final expenditures. Explain briefly their meaning.

9.   Name the related aggregates of national income.

10.   Explain the circular flows of income in a two sector economy.

11.   Explain the relationship among the three basic economic activities.

12.   Distinguish between intermediate goods and final goods

13.   What are transfer payments? How do they differ from factor payment?

ANSWERS TO INTEXT QUESTIONS

24.1

(i) Compensation of employees, rent, interest and profit

(ii) Read section 24.1 B

(iii) Read section 24.3

(iv) Read section 24.4

24.2

(i) A (ii) B (iii) C (iv) B (v) A (vi) B (vii) B

24:3

(i) C (ii) C (iii) C (iv) B (v) C (vi) C

24.4

(i) Net Indirect taxes; (ii) Depreciation; (iii) Factor income earned from ROW; (iv) Subsides (v) Net Indirect Taxes.

Notes

25

NATIONAL INCOME AND ITS MEASUREMENT

In the previous lesson you have learnt about the various concepts relating to national income and their related aggregates Understanding of these concepts is necessary for measuring national income.

In this lesson, you will learn how national income is measured. In lesson No. 24 you have learnt that national income is a flow. This flow can be looked at from three different angles.. Hence, there are three different methods of measuring national income. Each one of these methods is explained in details in this lesson.

OBJECTIVES

After completing this lesson, you will be able to:

- define national income;
- relate the national income from three different angles;
- identify production units located in the economic territory of a country into different industrial sectors;
- explain the meaning of the primary, secondary and tertiary sectors;
- explain the production method (or value added method) of measuring national income;
- explain the precautions to be taken while measuring national income by production method;
- explain the income distribution method of measuring national income;
- explain the precautions to be taken while measuring national income by income distribution method;

- explain the final expenditure method of measuring national income;

- explain the precautions to be taken while measuring national income by final expenditure method;

- show that all the three methods of measuring national income lead to the same result; and

- calculate private income, personal income, personal disposable income, national disposable income (gross and net).

Notes

25.1 METHODS OF MEASURING NATIONAL INCOME

The production units produce goods and services. For this they employ four factors of productions viz, land, labour, Capital and entrepreneurship. These four factors of production jointly produce goods and services i.e. they add value to the existing goods. This value added i.e. net domestic product is distributed among the owners of four factors of production receive rent, compensation of employees, interest and profit for their contribution to the production of goods and services. The incomes received by the owners of the factors of production are spent on the purchase of goods and services from the production units for the purpose of consumption and investment. In short, production generates income. Income is used for expenditure, and expenditure, in turn, leads to further production. There are three phases of circular flow of national income. So there are three methods of measuring national Income. They are

(A) Output or value added method

(B) Income method

(C) Expenditure Method.
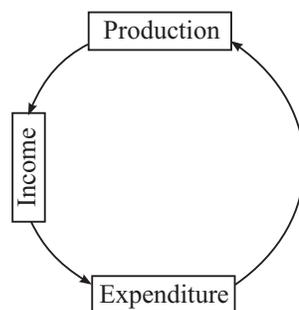
Fig. 25.1: Three phases in the circular flow of national income.

Notes

25.2 VALUE ADDED METHOD

With the help of this method national income is estimated at production level. At production level national income is the value of final goods and services produced in a country within the domestic territory plus net factor income from rest of the world. In this method following steps are involved:

Firstly, all the producing enterprises in an economy are broadly classified into three industrial sectors according to their activities. These are:

Primary sector: Primary sector consists of those producing units which are carried out by using natural resources. It includes productive activities like agriculture, forestry, fishing mining etc.

Secondary sector: This sector includes those producing units which transform inputs into output for example: transformation of wood into a chair. It includes sub sectors like construction, manufacturing, electricity, gas and water supply.

Tertiary sector: Producing units of this sector produce services of all kinds such as banking, trade, transport etc. This is also known as service sector. This sector includes transportation, communication, banking services etc.

Secondly: Net value added of each producing unit of the economy is estimated from their gross value of out put which is calculated by multiplying total volume of goods produced with their prices. After deducting the sum of value of intermediate goods (IG), depreciation and net indirect taxes (NIT) from value of output we get net value added at FC of the producing units. or

Net value added at FC = Gross value of output - IC - Dep - NIT

By adding up net value added at FC of all the producing units of a sector we get net value added at FC of that particular sector. The sum total of net value added at FC of all the three sectors in the domestic territory of a country gives us Net Domestic Product at Factor Cost.

Thirdly: Net National Product at factor cost is obtained by adding net factor income from ROW to net domestic product at factor cost.

If net factor income from ROW is negative, NDP at FC will be greater than net national product at factor cost (National Income), and if it is positive national income will be greater than NDP at FC.

From value of output to National Income (Production Method Value Added)

Intermediate Consumption				
Consumption of fixed capital	Consumption fixed capital			
Net Indirect taxes (NIT)	NIT	NIT		Net Factor Income from ROW
NVA_{FC} in the Tertiary Sector	NVA_{FC} in the Tertiary Sector	NVA_{FC}, in the Tertiary Sector	NVA_{FC} in the Tertiary Sector	$NDP_{FC}=$
NVA_{FC} in the Secondary Sector	NVA_{FC} in the Secondary Sector	NVA_{FC} in the Secondary Sector	NVA_{FC} in the Secondary Sector	compensation of employees + Rent + Interest + Profit
NVA_{FC} in the Primary Sector	NVA_{FC} in the Primary Sector	NVA_{FC} in the Primary Sector	NVA_{FC} in the Primary Sector	+ Mixed Inceome
Gross Value of output at MP	GDP at MP	NDP at MP	NDP at FC	NNP at FC (National Income)

Chart 25.2

Numerical Example

1. Calculate Gross value added at factor cost from the following :

     (i) Gross value of output at MP   10,500

    (ii) Depreciation   1000

   (iii) Indirect taxes   750

    (iv) Economic subsidies   200

     (v) Intermediate consumption   4000

    (vi) Compensation of employees   2000

Solution

Gross value added at Factor cost will be calculated as under:

Gross value of output at MP	10,500
+ Economic Subsidies	+200
– Intermediate Consumption	–4000
– Indirect Taxes	–750
	₹ 5950

Notes

Precautions

The following precautions are necessary while estimating national income by production method

(i) Production for self consumption : That output which is produced for self-consumption and whose value can be estimated, must be included in the estimates of production because it is a part of production of current year.

(ii) Sale of second hand goods : The sale of second hand goods should not be included in national income because the value of these goods had already been included earlier.

(iii) Commission paid to the broker for sale and purchase second hand goods should be included because it is payment made for the services provided in the current year.

(iv) Value of intermediate goods should not be included because it leads to double counting.

(v) Services of house wife should not be included because it is very difficult to evaluate them.

INTEXT QUESTIONS 25.1

Fill in the blanks with the help of clues given below Primary sector, secondary sector, Industrial sectors, value of production for self consumption tertiary sector.

(i) Fishing is a part of .... sector

(ii) The first step of estimating national income with the help of value added method is to identify the different economic activities and classifying them into different .... according to their activities.

(iii) .... should be included in the estimation of value of output.

(iv) Transportation is a part of .... sector.

25.3 INCOME METHOD

Income method is used for measuring national income at distribution level. According to this method, national income is estimated by adding incomes earned by all the factors of production for their factor services during a year. If includes the following steps:

(i) Firstly: Classify the production units into primary, secondary and tertiary sector. The classification is same as in value added method

(ii) Secondly: Estimate the following factor incomes paid out by the production units in each industrial sector.

(i)   Compensation of employees

(ii) Rent

(iii) Interest

(iv) Profit

(v)   Mixed income of self employed

The sum total of the above factor incomes paid out is the same as net value added at factor cost by the industrial sectors.

Thirdly : Take the sum of factor payments by all the industrial sectors to arrive at the net domestic product at factor cost.   .

Lastly : Add net factor income from abroad to the net domestic product at factor cost to arrive at net national, product at factor cost.

National Income and Related Aggregates
(Income Method)

					Net Indirect taxes
Net Indirect Taxes				Consumption of fixed capital	Consumption of fixed capital
Consumption of fixed capital	Consumption of fixed capital		Net factor in come from ROW	Net factor in come from ROW	Net factor in come from ROW
Profit	Profit	Profit	Profit	Profit	Profit
Interest	Interest	Interest	Interest	Interest	Interest
Rent	Rent	Rent	Rent	Rent	Rent
Mixed income of self employed	mixed income	mixed income	mixed income	mixed income	mixed income
Compensation of employees	Compensation of employees	Compensation of employees	Compensation of employees	Compensation of employees	Compensation of employees
GDP at MP	GDP at FC	NDP at FC	NNP at FC (National Income)	GNP at FC	GNP at MP

Chart 25.3

Numerical Example

1. Calculate national income from the following data:

		(₹ Crores)
(i)	Consumption of fixed capital	50
(ii)	Employers contribution to social security	75
(iii)	Interest	160
(iv)	Net Indirect Taxes	55
(v)	Rent	130
(vi)	Dividends	45
(vii)	Corporate Tax	15
(viii)	Undistributed profit	10
(ix)	Net factor income from abroad	–10
(x)	Wages and salaries	450

Solution

$$NDPfc = (X) + (ii) + (iii) + (v) + (vi) + (vii) + (viii)$$

$$= 450 + 75* + 160 + 130 + 45 + 15 + 10 = 885 \text{ Cr.}$$

$$NNP \text{ at fc} = NDPfc + (ix)$$

$$= 885 + (-10) = 875 \text{ Cr.}$$

Notes of solution

- Since wages and salaries and employer contribution to social security are given separately, these must be added to obtain compensation to employees.

- Dividend, undistributed profit and corporate taxes are to be added to get Total profit/Retained Earnings.

- Net indirect taxes, is not required in this question. Similarly consumption of fixed capital is also not required in this question.

Precautions

The following are some of the main precautions which must be taken while estimating national income by the income distribution method

(a) While estimating compensation of employees all benefits accruing to the employees whether in cash or in kind must be included.

(b) In estimating interest, the interest on only those loans should be included which are taken for production, The interest on loans taken to meet consumption expenditure is not included in national income as it is treated as transfer payment.

(c) Gifts, donations, charities, taxes, fines, income from lotteries etc., are not factor incomes but transfer incomes. These should not be included in estimating national income.

(d) Income from sale of second hand goods should not be included as it is not the income received from the goods produced in the current year.

INTEXT QUESTIONS 25.2

Which of the following are included in National Income and why as per Income Method.

(a) The Income of dertist.

(b) Rent Recieved on two Bed room Apartment.

(c) The Service of painter painting his own room

(d) The monthly pocket money received by student from his father.

25.4 FINAL EXPENDITURE METHOD

National income can also be measured at disposition phase with the help of expenditure method. It estimates national income by measuring final expenditure on gross domestic product at market price.

Expenditure incurred on final goods is final expenditure. Final goods are those goods which are demanded for final consumption and investment. The demand for final consumption and investment is made by all the four sectors of the economy, namely, households, firms and the government and rest of the world.

The main steps involved in measuring national income by this method are:

Firstly: Estimate the following expenditure incurred on the final products of all the sectors of the economy.

(i) Private final consumption expenditure.

(ii) Government final consumption expenditure.

(iii) Gross Investment

(iv) Net exports (exports - imports).

The sum total of all the above expenditures on final products of all the sectors of the economy gives us gross domestic product at market price.

Secondly: Deduct consumption of fixed capital (Depreciation) and net indirect taxes from gross domestic product at market price to get net domestic product at factor cost.

Notes

$NDPFC = GDPmp$ - consumption of fixed capital - Net indirect tax (indirect taxes - subsidies)

Thirdly: Add net factor income from abroad to the net domestic product at factor cost to obtain net national product at factor cost which is the national income.

$NNPFC = NDPfc$ + net factor income from abroad

(National Income)

National Income (Expenditure Method)

Gross Investment	(-) Depreciation		
Private Final consumption expenditure		(-) Net Indirect Tax	+ Net Factor Income from Abroad
Govt. Final consumption expenditure			
Net Exports (Exports - Imports)			
GDP_{MP}	NDP_{MP}	NDP_{FC}	NNP_FC (National Income)

Chart 25.4

Numerical Example

Calculate national income from the data given below by expenditure method.

	Item	₹ (In crores)
(i)	Personal consumption expenditure	3500
(ii)	Consumption of fixed capital	50
(iii)	Net fixed capital formation	1250
(iv)	Change in stock 500 (v) Exports	400
(vi)	Imports 750 (vii) Net indirect taxes	40
(viii)	Governments' consumption expenditure	1600
(ix)	Net factor income from abroad	(-) 10
(x)	Wages and salaries	450

Solution

	₹ (In crores)
Personal Consumption expenditure	3500
+ Net fixed Capital Formation	1250
+ Change in Stock	500
+ Govt. Consumption Expenditure	1600
+ Net Exports (Exports-Imports)	-350
Net Domestic product at market price	**6500**
(-) Net Indirect Taxes	40
Net Domestic product at Factor Cost	**640**
+ Net factor Income from abroad	(-) 10
NNP FC (National Income)	**6450**

Please Note

1. Since Net Fixed Capital Formation is given, we are asked to calculate net National Product at factor cost. Thus, consumption of fixed capital is not required here.

2. Since, fixed capital is given, we need to add change in stock to get the total domestic capital formation (Investment)

3. The entry wages and salaries are not required here.

Precautions

The main precautions required to be taken in estimating national income by expenditure method are:

(i) Expenditure on intermediate products should not he included to avoid the problem of double counting.

(ii) Expenditure on gifts, donations, taxes, scholarships etc. should not be included in National Income as these are transfer payments.

(iii) Expenditure incurred on purchase of second hand goods should not be included as the expenditure on these goods has already been included when bought for the first time.

(iv) Expenditure on purchase of bonds and shares should not be included as these are financial transactions.

Notes

INTEXT QUESTIONS 25.3

Which of the following are included in GDPmp and why as per Expenditure Method.

(a) A purchase of a share.

(b) Construction of a room in existing building.

(c) Purchase of machinery.

(d) Money received by student who has sold his book back to book seller.

25.5 RECONCILIATION OF THE THREE METHODS

The three methods are summarized in the following table:

Value Added Method	Income Distribution Method	Final Expenditure Method
Sum of GVAmp, of all industrial sectors	Compensation of employees	Private final consumption expenditure.
	+ Rent	+ Government final
	+ Interest	consumption expenditure
	+ Profit	+ Gross domestic capital
	+ Mixed Income	formation (Gross Investment)
	+ Consumption of fixed capital	+ Net exports
	+ Indirect Tax	
	– Subsidy	
= GDP$_{MP}$	GDP$_{MP}$	= GDP$_{MP}$
– consumption of fixed capital	– Consumption of fixed capital	– consumption of fixed capital
– indirect taxes	– Indirect tax	– indirect taxes
+ subsidies	+ Subsides	+ subsidies
+ Net factor income from abroad	+ Net factor income from abroad	+ Net factor income from abroad
= NNPfc	= NNPfc	= NNPfc

Chart 25.5

INTEXT QUESTIONS 25.4

Fill in the blanks:

Tertiary, compensation, transfer, investment, consumption

(i)   Gifts, donations taxes etc. are .... payments.

(ii)   Interest payment on loans taken to meet .... expenditure is not treated as factor income.

(iii)   Benefits in kind received by the employees is a part of the .... of employees.

(iv)   The expenditure on purchasing furniture by a production unit is a part of ....

(v)   Employing of domestic servant is a part of .... sector.

25.6 NATIONAL PRODUCT AND OTHER AGGREGATES

We have already studied that the sum of net value added by all the production units in the domestic territory is net domestic product of factor cost (NDP_{fc}). All the income generated in a year is not received by consumer households. Income from property and entrepreneurship accruing to the departmental commercial enterprise of the government is retained by the government. Secondly non-departmental enterprises of the government save a part of their profits for future expansion. This sum also is not available for distribution. It these two sums are deducted from NDP_{fe}, we get income from domestic product or NDP_{fc} accruing to private sector.

Income from domestic product accruing to private sector = NDPfe – income from property and entrepreneurship accruing to government administration department savings of non-departmental enterprises.

(i)   **Private income:** Private income consists of factor incomes earned within the domestic territory and abroad by private enterprises and workers (factor owners in the private sector) and current transfer from government and the rest of the world.

Private income =   Income from domestic product accruing to private sector + Net factor income from abroad + national debt interest + current transfers from government + other current transfers from the rest of the world (net)

(ii)   **Personal income** : Personal income is defined as the current income of persons or households from all sources. We have to deduct undistributed profit and corporate tax payable by the enterprise from private income to arrive at personal income

Personal inome = private income - saving of private corporate sector (undistributed profit) - corporation tax

(iii) Personal disposable income: The household cannot spend the entire personal inome. Government takes away a part of it by way of inome tax and other miscellaneous taxes such as education tax, fire tax, sanitation tax. These taxes have to be deducted from personal income to arrive at personal disposable income.

Personal disposable income = Personal inome – direct taxes paid by the households – miscellaneous receipts of the government.

Personal disposable inome is the inome available to persons from all sources to dispose of as they choose.

27.7 NATIONAL DISPOSABLE INOME (NET AND GROSS)

National disposable income refers to the inome which is available to the whole country for disposal. It includes both earned inome and transfer income (unearned income)

Net national disposable inome = NNP_{mp} + Net current transfers from rest of the world.

or NNP_{fc} + NIT + Net current transfer from rest of the world

Gross National Disposable income = GNP_{mp} + Net current transfers from rest of the world.

Numerical examples on calculator of national income and other related aggregates

Example 1: From the data given below, calculate private income:

		(₹ in crores)
(i)	NDPfc	2,000
(ii)	Income from property and entrepreneurship accruing to government]	100
(iii)	Saving of non-departmental enterprises	20
(iv)	National debt interest	5
(v)	Net factor income from abroad	(-)10
(vi)	Net current transfers from government	15
(vii)	Net current transfers from ROW	25

Soution:

Income from domestic product accruing to private sector

$$= NDPfc – (ii) – (iii)$$

$$= 2000 – 100 – 20$$

$$= ₹ 1880 \text{ Crores}$$

Private income = Income from domestic product accruing to private sector

$$+ (iv) + (v) + (vi) + (vii)$$

$$= 1880 + 5 + (-)10 + 15 + 25$$

$$= ₹ 1915 \text{ crores}$$

Example 2: Calculate (a) personal income (b) Personal disposable income

		₹ in crore
(i)	Private income	1915
(ii)	Income from domestic product accruing to private sector	1880
(iii)	Net factor income from abroad	(-) 10
(iv)	Corporation tax	25
(v)	Savings of private corporate sector	15
(vi)	Direct taxes paid by households	25
(vii)	Other miscellaneous receipts of government administrave departments	5

Soution:

(a) Personal income = Private income – (iv) – (v)

$$= 1915 – 25 – 15$$

$$= ₹ 1875 \text{ crores}$$

(b) Personal disposable income

$$= \text{personal income} – (vi) – (vii)$$

$$= 1875 – 25 – 5$$

$$= ₹ 1845 \text{ crores}$$

Example 3: Calculate (a) Gross National disposable inocme (b) Net National disposable income

		₹ in crore
(i)	NNP_{fc}	3,000
(ii)	Net current transfers from government	20
(iii)	Net current transfers from Row	25
(iv)	Net indriect taxes	50
(v)	Depreciation	40

Soution:

(a) Gross National Disposable income

$$= GNPmp + \text{Net current transfers from Row}$$

$$= [(i) + (v) + (iv)] + (iii)$$

$$= 3000 + 40 + 50 + 25$$

$$= ₹ 3115 \text{ crores}$$

(b) Net national disposable income

$$= NNP_{mp} + \text{Net current transfers from ROW}$$

$$= [(i) + (iv)] + (iii)$$

$$= 3000 + 50 + 25$$

$$= ₹ 3075 \text{ crores}$$

WHAT YOU HAVE LEARNT

- There are three phases of circular flow of national income. Accordingly there are three methods of measurement of national income: value added or production method, income distribution method and final expenditure method.

- The first step in the measurement of national income of a country is to classify its production units into different industrial sectors. The primary sector includes all units engaged in exploiting natural resources. The secondary sector transforms one good into another good. The production units in the services sector produce services.

- The main steps in the value added method are: estimate NVAfc by all sectors and add them to arrive at NDP_{FC}. Add net factor income from abroad to NDP_{FC} to obtain NNP_{FC}.

- The main steps in the income distribution method are: estimate factor incomes paid out by each sector; take the sum of these incomes paid out by all the sectors to get, NDP_{FC}; add net factor income from abroad to get NNP_{FC}.

- The main steps in the final expenditure method are: estimate the sum of final expenditure on consumption and investment to get GDP_{MF}, deduct consumption of fixed capital and indirect taxes and add subsidies to GDPmp to arrive at NDP_{FC} and add net factor income from abroad to NDPfc to get NNPFC.

TERMINAL EXERCISE

1. Explain the three phases of circular flow of national income.

2. Explain the nature of functions of primary, secondary and tertiary sectors.

3. Explain the steps taken in measuring national income through the value added method.

4. What are the main precautions required to be taken in estimating national income by the value added method?

5. Explain the steps involved in estimating national income through the income distribution method.

6. What are the main precautions required to be taken in estimating national income by the income distribution method?

7. What are the main steps in the expenditure method of estimating national income?

8. Point out some of the precautions taken in estimating national income through the final expenditure method.

9. From the following data, estimate the net value added at factor cost and show that it is equal to the sum of factor incomes :

(i)	Sales	9600
(ii)	Increase in stock	2080
(iii)	Intermediate Consumption	2370
(iv)	Depreciation	450
(v)	Wages and salaries	5400
(vi)	Internet	250
(vii)	Rent	750
(viii)	Profit	2150
(ix)	Net indirect Taxes	310

10. Find out "Net value added at factor cost by an enterprise from the following data:

₹ In crores

(i)	Consumption of Fixed Capital	10
(ii)	Subsidies	5
(iii)	Indirect Taxes	25
(iv)	Purchase of material and Services from other production units	75
(v)	Value of output	125

(Ans. = 70 Corers)

11. Calculate value added by Firm A & B from the following data:

₹ (Lakh)

(i)	Purchase by Firms B from Firm A	40
(ii)	Sales by Firm B	80
(iii)	imports by Firm. B	10
(iv)	Rent Paid by Finn B	05
(v)	Opening stock of Firm B	15
(vi)	Closing stock of Firm B	20
(vii)	Purchases by Firm A from Firm B	20
(viii)	Closing stock of Firm A	20
(ix)	Opening stock of Firm A	10

12. From the data given below, calculate
    (a) National income
    (b) Private income
    (c) Personal income
    (d) Personal disposable income
    (e) Gross National disposable income

₹ (in crores)

(i)	Compensation of employees	1000
(ii)	Mixedx income of self employed	2500
(iii)	Depreciation	50
(iv)	Net factor income from abroad	20
(v)	Rent	200
(vi)	Interest	100

(vii)	Profit	500
(viii)	Net Indirect taxes	300
(ix)	National debt interest	70
(x)	Current transfers from governmment	60
(xi)	Net current transfers from ROW	70
(xii)	Corporation tax	30
(xiii)	Savings of private corporate sector	20
(xiv)	Direct taxes paid by households	15

Notes

ANSWERS TO INTEXT QUESTIONS

25.1

(i) Primary sector (ii) Industrial sectors (iii) Production for self consumption (iv) tertiary

25.2

(a) Included, as it is payment for final service/factor payment.

(b) Included, as it is payment for final service used by the tenant.

(c) Excluded, as it is not a market transaction.

(d) Excluded, as it is a transfer payment (unilateral payment or unearned income).

25.3

(a) Excluded, as it is mere transfer of ownership from one person to another.

(b) Included, as it is a part of gross Investment.

(c) Included, as it is a part of gross Invesmtment.

(d) Excluded, as it is second hand transaction and value had already been counted at the time of its production.

25.4

(i) Transfer (ii) consumption (iii) compensation (iv) investment (v) tertiary

MODULE - X
THEORY OF INCOME AND EMPLOYMENT

26. Consumption, Saving and Investment

27. Theory of Income Determination

26

CONSUMPTION, SAVING AND INVESTMENT

Production, consumption and capital formation are three basic economic activities of an economy. This lesson deal with the study of consumption and capital formation in the economy as a whole. It should be noted that 'capital formation' can be referred to as saving or investment depending on the context in which the term is being used. You have already gone through the study of consumption at a micro level in the lessons on utility analysis, indifference curve approach and demand analysis. *The theory of consumption at micro level courses on consumption behaviour of the economy as a whole at an aggregate level. Also saving and investment at aggregate level will be dealt with.*

OBJECTIVES

After completing this lesson, you will be able to:

- define consumption function and saving function;
- explain propensity to consume and save;
- identify the factors determining propencities to consume and save; and
- distinguish between autonomous and induced investment.

26.1 CONSUMPTION FUNCTION

Everybody needs income to purchase goods and services. Higher the level of income, higher will be the capacity to buy the goods and services. So for an individual, the total amount of goods and services to be purchased depends on the available disposable Income of the Consumes. Similarly, taking all the individuals living in the society or economy as whole into consideration, it can be said that the

aggregate consumption of all depends on the total income generated in the economy. When the total income of the economy increases total consumption of the economy will also increases. In the same way, it can also be said that economy with higher level of national income consumes more than the economy which has lower level of national income.

Example 1: In India the household finall consumption expenditure as percentage of GDP increased from 59 per cent in 2011 to 60 percent in 2012 with increase in GDP. In USA, which is a developed economy the share of household consumption expenditure in its GDP is 69 percent in 2012 which was higher than that of India.

The relationship between consumption and the level of income in called consumption function. Consumption function tells that consumption is a function of income, or in other words, consumption depends on the level of income.

If should be noted here that, when we talk about income, we normally mean disposable income. Disposable income is that part of total income which is available for consumption and saving. To elaborate it further, note that when a person receives income in return of factor services rendered by him/her, he/she may not spend all the income on consumption only. There are certain compulsory payments he/she has to make out of the income received, such as tax to the government, fines if any etc. As a result the income available for consumption needs is reduced. Disposable income is defined as the income remained after payment of tax and fines etc. If tax payment in high, disposable income will be lower and vice versa. Accordingly, the level of consumption will be affected.

It should be noted that disposable income and total income will be same if tax payment and fine are not existing or zero.

Example 2: Individual A receives an income of Rs 10,000. He paid income tax at a rate of 2 percent. What is his disposable income?

Ans: 2 % of 10,000 = tax paid = 200

Hence disposable income = 10000–200 = Rs. 9,800.

Example 3: Individual B receives an income of Rs 5000. He has not paid any tax. What in his disposable income?

Ans: Since tax paid = 0, disposable income is same as total income, i.e.

5000 – 0 = Rs 5000.

In this lesson we will treat income and disposable income as one and the same.

26.2 PROPENSITY TO CONSUME

The relationship between consumption and (disposable) income can be further elaborated by studying propensity to consume. Under this we compare the figures of consumption and income in each time period. In order to establish the nature of relationship between them, two important calculations are made in this context. One, Average propensity to consume (APC) and two, Marginal propensity to consume (MPS).

Notes

APC (Average Propensity to Consume)

APC is defined as the ratio of consumption to income. This ratio in calculated to know the proportion of income devoted for consumption purposes in the specific period of time for which data is given. So APC is calculated for each time period. Let consumption for any particular time is denoted as 'C'. Let income of that period is denoted as Y. Then

$$APC = \frac{C}{Y}$$

Example 4: If consumption is Rs 300 Cr. and income is Rs 600 crore, what is APC? What does this imply?

Ans: $APC = \dfrac{300}{600} = \dfrac{1}{2} = 0.5$

This implies that on an average 50 percent of the total income has been spent on consumption.

Example 5: In the country *X*, 70 percent of the income has been devoted to consumption. If income is Rs1000 crore, find out consumption?

Ans: $Consumption = \dfrac{70}{100} \times 1000 = 700$

Consumption = Rs 700 crore.

Hint: Here APC = 70 percent, Y = 1000

since $APC = \dfrac{C}{Y}$, $C = APC \times Y$

Example 6: In a country, consumption amount is Rs. 800 crore which is 80 percent of its total disposable income? What is the amount of disposable income?

Ans: Disposable Income = Rs 1000 crore.

[Hint: Here APC = 80 percent, C = 800

Since $APC = \dfrac{C}{Y}$, $Y = \dfrac{C}{APC}$. So Y = $Y = \dfrac{800}{\dfrac{80}{100}} = 800 \times \dfrac{100}{80} = 1000$

MPC (Marginal propensity to Consume)

MPC is the ratio of change in consumption to change in income between two time periods. Denote "increase in" as "Δ", We can write

$$MPC = \frac{\Delta C}{\Delta Y}.$$

Since consumption depends on income, increase in income will bring about increase inconsumption over time period. In this context, MPC measures the increase in the amount of consumption due to increase in the amount of income in the country.

Example 7: If consumption in period 1 is 200 and income is 300 and the same for period 2 stands at 250 and 400 respectively, find MPC?

Ans: $MPC = \dfrac{\Delta C}{\Delta Y} = \dfrac{250 - 200}{400 - 300} = \dfrac{50}{100} = 0.5$

From the above example, you can make out that Δ is the difference between the values of two periods i.e.

Δ = Value of current period – value of last period.

The famous economist, Keynes, who gave the concept of propensity to consume, said that, MPC is normally less than unity. Symbolically,

MPC < 1.

Since $MPC = \dfrac{\Delta C}{\Delta Y}$, this implies that $\dfrac{\Delta C}{\Delta Y} < 1$.

This further implies that ΔC < ΔY.

Putting it in words, it can be said that increase in consumption is less than the corresponding increase in income. Note that in example 6 above, MPC = 0.5 which is less that 1.

Psychological law of consumption: Let us ask why MPC is less than 1?

To answer this question, Keynes has provided the "Psychological law of consumption."

According to this law, as income increases over time, consumption on also increases, but at a slower rate as compared to that of income.

So the reason behind MPC being a fraction (less than one) is given in terms of psychological behaviour of the individuals taken together in the economy. It is commonly observed that people do not consume the entire part of increase in their income. They, certainly increase the amount of consumption with increase income as they get a scope to increase their level of satisfaction. But, at the same time, they do wish to save a part of the increase in income for future needs. Saving a part of income for future reflects a sense of security which is psychological in nature.

So increase in income is divided between increase in consumption and increase in saving. Symbolically, we can write that

$$\Delta Y = \Delta C + \Delta S.$$

i.e. increase in income = increase in consumption + increase in saving. From this it is clear that ΔC is less than ΔY. So MPC or in less than one.

INTEXT QUESTION 26.1

1. Consumption depends on (a) saving, (b) disposable income, (c) needs (d) none of the above

2. A person pays 20 percent of his income as tax. If income is 2000, find out disposable income?

3. Total income is same as disposable income if

    (a) consumption = 0,   (b) Saving = 0

    (c) tax and fines = 0,   (d) income = 0.

4. Given that consumption is 500 and income in 700. Find out APC?

5. Give to increase in income from 1000 to 1500, consumption has increased from 750 to 900. Find out MPC?

26.3 EQUATION OF CONSUMPTION FUNCTION

Economist Keynes, provided the equation of consumption function. He assumed a short run period in which the economy is functioning. He argued that short run is more important because people are more concerned about their immediate consumption needs. He argued that even consumption depends on the level of income, people still manage to consume the necessities needs to sustain oneself, even if there is no income for the time being. To explain this further, think that an

individual is waiting to receive his income after two months. Does it mean that he will start consuming only after two months! No. He has to take food and wear clouses which are bare necessities of life. He has to purchase these either by borrowing money or by arranging the money by selling some of his assets. He will repay the loan or recover the asset after he gets his income after two months but as of now, he is having some consumption even if his income is zero for the time being.

Similarly in the economy, there are children and old people who do not have any income but they consume by depending on others who are earning. For example in a family, children depend on their working parents to consume goods and services. An old person depends on the income of his son or daughter or pension from the government to consume things he needs now.

Hence, at any point of time in the short run there is some fixed amount which the population of the economy spent on consumption even if income is zero or nothing. This part of consumption is called autonomous or fixed consumption. It is a constant and can take any numerical value. Let us denote this value as a.

The other part of consumption comes from the income and the manner in which it increases over time. Once people start getting their income, they use it to repay the loans taken earlier, save for future and spend a fraction on consumption, over and above the fixed amount of consumption which they had already made earlier. The additional consumption over and above the fixed consumption on necessary things in influenced by the level of income received and MPC of the people. MPC comes into picture here because it reflects the consumption behaviour of the population out of their income.

On the basis of the above arguments as provided by Keynes, we can write the equation of consumption function in the following manner:

Consumption = Some fixed amount plus MPC times the current level of income.

Symbolically,

$$C = a + MPC \times Y$$

where   C = Consumption

     or   Y = fixed consumption

(Fixed consumption is also called Autonomons consumption i.e. COnsumption at Zero level of Income)

        Y = Income (disposable Income)

$$MPC = \frac{\Delta C}{\Delta Y}$$

MPC is less than one.

Denote MPC as '*b*'.

Then equation for consumption in given as

$$C = a + bY.$$

Example 8: In an economy, the population spend Rs 500 crore on absolute necessities needed to sustain themselves. The current income is Rs 2500 crore and MPC is 0.5. What is the level of consumption?

Ans: $C = 500 + 0.5 \times 2500$

   $= 500 + 1250 = 1750$

So consumption is Rs. 1750 crore.

Now, find, the value of consumption (C) If income is zero i.e.

   $Y = 0,$

Since $C = a + b\,Y$

Putting $Y = 0,$ it becomes

   $C = a + b.\,0$

or $C = a.$

So when income in nothing, consumption is equal to the fixed amount which people require to sustain themselves.

In the above example, putting $Y = 0,$

We get C = Rs 500 crore.

What will happen if Y in changed to Rs 3000 cr. Then C = 500 + 0.5 × 3000 so C = 500 + 1500 i.e. C = Rs 2000 cr.

This implies that given the value of 'a' and MPC (*b*), C will be determined as per the value of Y.

Diagram of consumption Function: The above equation of consumption function can be shown diagrammatically. Note that in the above equation there are two variables–consumption (*C*) and income (Y). Consumption (*C*) is determined depending on the value of Y, given the value of '*a*' and MPC. While drawing the diagram of consumption function on a graph paper, take C values along the vertical axis and the income or Y values along the horizontal axis. The diagram is shown below.
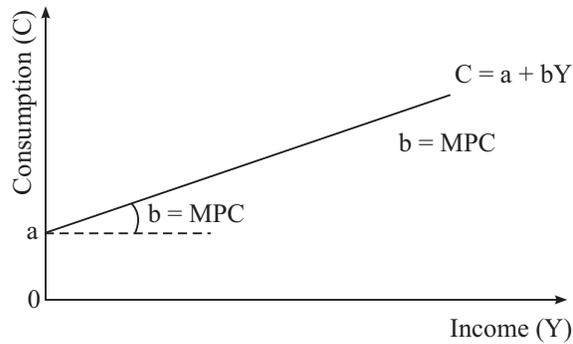
Fig. 26.1

As shown in the fig. 26.1 above, consumption function (C) starts from a point at 'a' on the vertical axis. This means that, if we put income Y, equal to zero, then C equals a as said above. The distant '0' a is the measure of fixed consumption amount in the economy when income is zero. When Y increases along horizontal axis, then C will also increase at a rate equal to MPC (b) along the line aC. aC is the consumption function.

Take the example given above where we have said that $C = 500 + 0.5 \times 2500$.

It can be shown in the following fig. 26.2.
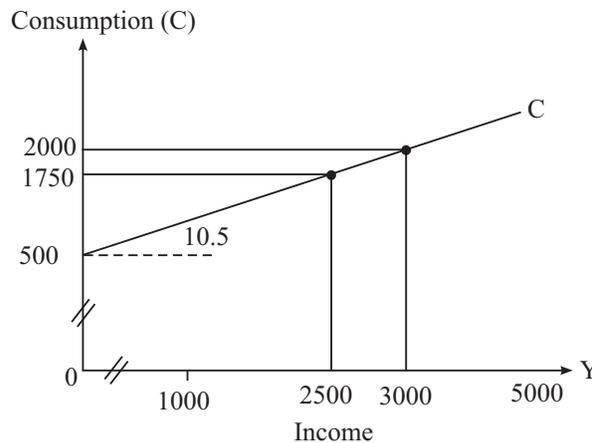
Fig. 26.2

Since a = Rs 500 crore in the example, the consumption function will start from 500 on the vertical axis. The function will rise at an angle 0.5 as MPC = 0.5. See that when Y = 0, $C = a = 500$. At Y = 2500, $C = 1750$ and at Y = 3000 $C = 1500$ as calculated earlier. Note that with increase in income, consumption rises at a rate equal to MPC. So the slope of consumption function in MPC.

Diagrammatically, consumption function can be described as a straight line

originating from a point on the vertical axis and slopping upwards from left to right rising at an angle equal to MPC.

Break even point

We saw that when income $Y = 0$, $C = a$ (positive value). When income increases above zero then C will also increase at the rate of MPC. Initially C may be more than Y due to the presence of the fixed value 'a'. But when Y starts in-creasing, C will also increase at a lower rate than that of Y as per psychological law of consumption. So, a time will come when C will fall below Y after getting equal to it. The point where income and consumption are equal, is called the "break even " point in the economy.

Take the earlier equation again.

$C = 500 + 0.5 \times Y$.

Where $a = 500$, MPC $= 0.5$. Now, put different values of Y, starting from zero and determine the values of C accordingly. You can easily find the point where $C = Y$ as given in the table below.

Table 26.1: Break even point

Y	C	Remark	
0	500	$C > Y$	
500	750	$C > Y$	
1000	1000	$C = Y$	break even
1500	1250	$C < Y$	
2000	1500	$C < Y$	

As show in the table using the equation we find that when Y $= 0$, $C = 500$. Then when Y takes the value **500, C becomes low, C also becomes 1000**. This is the break even point. After that when Y further increases beyond 1000, C increases but remains below Y as shown in the table. At Y $= 1500$, $C = 1250$ and so on.

INTEXT QUESTION 26.2

1. Write the equation for consumption function, C given that fixed consumption amount is 100, MPC $= 0.75$ and income is denoted as Y.

2. If fixed consumption is 50, MPC $= 0.8$ and income is 200, what will be the value of consumption?

3. What is the slope of consumption function called?

4. Consumption function is a downward sloping line. True or False.

5. The distance between the origin and the point from which the consumption function starts on the vertical axis is a measure of–

   (a) saving   (b) income

   (c) fixed consumption   (d) disposable income.

Determinants of propensity to consume

It is commonly asked that what are the factors that influence consumption behaviour in the economy besides income? In other words what are the determinants of propensity to consume other than income? Let us identify some important factors as follows:

(i) Rate of interest, (ii) Wealth (iii) Distribution of income (iv) consumer credit.

(i) Rate of interest

Commercial bank offer a certain rate of interest on the deposits held by public and charges rate of interest on the loans given to public. When people donot want to purchase goods and services, they keep their money in the bank to earn rate of interest. But when they want to buy goods and services, they with draw money from the bank and loose interest in the process. In this way rate of interest play an important role in influencing a person's decision to consume now or in futrue.

It should also be noted here that, according to Keynes, rate of interest may not be an important factor in influencing consumption decision in a short run time period. Urgent and immediate consumption needs have to be satisfied without considering the rate of interest factor. This happens because consumption is directly related to satisfaction of wants at present which is more important than earning rate of interest in future by deferring consumption today.

For investors and producers, however, rate of interest play an important role in their decision making regarding capital investment. To make investment producers need loan from bank. If the rate of interest in high the cost of borrowing will be high. This may discourage them to invest as per their desire and or need. On the otherhand, if the rate of interest is low, producers may be encouraged to invest more.

(ii) Wealth

Propensity to consume is influenced by a person's holding of wealth. People who have wealth in the form of gold, jewellery, ownership of land and building, shares and bonds etc enjoy a higher level of income generated from the wealth, Accordingly their consumption level will be higher.

(iii) Distribution of Income

Propensity to consume is affected by the distribution of income in the economy. You know that national income is distributed in the form of wage, rent, interest and profit. It is often observed and experienced that wage earners are exploited by the people who own property and business and earn rent, interest and profit. As a result there exist ineqality in income distribution leading to division of the society into poor and rich. It is obvious that rich people consume more than poor people. Accordingly the economy's propensity to consume will be affected.

(iv) Consumer credit

Finally, availability of consumer credit influences consumption behaviour to a large extent in the economy. There are many durable goods which consumers want to buy. But due to lack of credit facility, they are not able to buy them as they are costly items. Items such as car, scooter, TV, refrigerator, washing machine etc. are costly durable goods and also necessary for satisfaction of wants. Working people in urban area have got high demand for these goods.

With easy credit facility provided by banks, now people are buying these items in large quantities by paying easy instatments to the banks.

Saving Function

Both consumption and saving form two parts of a person's disposable income. The way consumption depends on the level of disposable income, saving also depends on the same.

Saving function gives the relationship between saving and income in the economy. Saving can be defined as that part of income (or disposable income) which is not consumed. This follows from the psychological law of consumption stated earlier. Let us denote saving as S.

In order to calculate saving, use example 7 given earlier in this lesson. In that example we had written that

$C = 500 + 0.5$ Y. Taking Y as 2500 we calculated that (C = 1750).

From this example we can calculate saving by deducting consumption from income. That is

$$S = Y - C$$

or $\qquad S = 2500 - 1750 = 750.$

26.4 PROPENSITY TO SAVE

Saving behaviour of people can be studied by calculating propensity to save in two ways.

(i)   Average propensity to save (APS)

(ii)   Marginal propensity to save (MPS).

APS: APS is defined as the ratio of saving and income at any point of time. Symbolically

$$APS = \frac{S}{Y}$$

APS gives the idea about the proportion of income devoted towards saving MPS.

MPS

MPS is defined as the ratio of change in saving and change in income. Over a period of time. MPS is a rate of change in saving vis-a-vis income. Symbolically

$$MPS = \frac{\Delta S}{\Delta Y}$$

where ΔS = current period saving - last period saving

ΔY = current income – last period income

MPS in always less than 1.

Example: If income changes from 1000 to 1500 and saving changes from 200 to 250, then calculate APS and MPS?

Ans: MPS $= \dfrac{\Delta S}{\Delta Y} = \dfrac{250-200}{1500-1000} = \dfrac{50}{500}$

$= \dfrac{5}{50} = \dfrac{1}{10} = 0.1$

We can calculate APS for both time period. In the first time period, S = 200 and Y = 1000

So, $APS = \dfrac{S}{Y} = \dfrac{200}{1000} = 0.2$

In the second time period

$$APS = \frac{S}{Y} = \frac{250}{1500} = \frac{1}{6} = 0.16$$

Relationship between propensity to consume and save

APC and APS are related in the following manner.

(i) The sum of APC and APC is unity.

i.e. $APC + APS = 1$

This implies that

$$APC = 1 - APS$$

$$APS = 1 - APC$$

Proof : $$APC = \frac{C}{Y}$$

$$APS = \frac{S}{Y}$$

$$APC + APS$$

$$= \frac{C}{Y} + \frac{S}{Y}$$

$$= \frac{C+S}{Y} = \frac{Y}{Y} = 1 \quad (\text{Since } C + S = Y) \text{ Proved.}$$

(ii) The sum of *MPC* and *MPS* in unity.

i.e. $MPC + MPS = 1$

This means that

$$MPC = 1 - MPS$$

$$MPS = 1 - MPC$$

Proof: $$MPC = \frac{\Delta C}{\Delta Y}$$

$$MPS = \frac{\Delta S}{\Delta Y}$$

Notes

MPC + MPS

$$= \frac{\Delta C}{\Delta Y} + \frac{\Delta S}{\Delta Y}$$

$$= \frac{\Delta C + \Delta S}{\Delta Y} \qquad\qquad (\because \Delta C + \Delta S = \Delta Y)$$

$$= \frac{\Delta Y}{\Delta Y} = 1 \text{ proved.}$$

Deriving the Equation for Saving

We have already given the consumption function equation as:

$$C = a + b\ Y.$$

We also said that Saving is calculated by deducting consumption from income.

i.e. $\qquad\qquad S\ = Y - C$

Now substitute value of C as given in the equation.

So, $\qquad\qquad S\ = Y - \{\ a + b\ Y\}$

$$= Y - a - b\ Y$$

$$= -\ a + Y - b\ Y$$

Factor out Y to give

$$S = -\ a + (1 - b)\ Y.$$

The saving equation consists of the negative value of the fixed consumption 'a' and $(1-b)$ times the value of income. Which is the value of saving itself out of income.

Note that, we have said earlier that, a constant amount of money 'a' is always denoted for consumption, even if income is zero. this amount can be a borrowed amount or can be acquired by reducing or selling asset of the person. Borrowing or reduction of asset is an act of dis-saving or opposite to saving activity or negative saving. In any case when income Y = 0, then $C = a$. So $S = Y - C = 0 - a = -\ a$.

Hence the first part of saving equation is a negative of the constant a. The second part of saving equation is $(1-b)$ Y. Here $b = MPC$. So $1 - b = MPS$. Hence $(1 - b)$ $Y = MPS \times Y$. This implies that the value of saving out of income is calculate of as MPS times the value of income.

In the example given above, we gave that

$$C = 500 + 0.5 \, Y$$

where a = 500

$$MPC = 0.5$$

So $$MPS = 1 - MPC = (1 - 0.5)$$

Now we can write the saving function

$$S = -500 + (1 - 0.5) \, Y$$

$$S = -500 + 0.5 \, Y$$

Solving for *S*, We can easily find that *S* = 750 as calculated earlier.

Diagram of Saving Function

The saving function will start from the negative quotient from a value equal to '–a' on the vertical axis and then it will be upward stoping at a slope (or angle) equal to 1–*b* or *MPS*. See the diagram of saving function below.
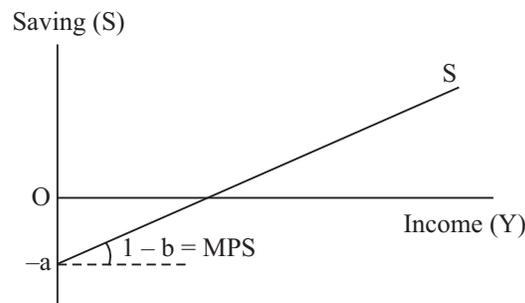
Fig. 26.3

In fig. 26.3 –*a*S is the saving function which starts from –a (below origin) and slope upward at a rate equal to 1–b or MPS. The distance '0 to –a' is the amount of fixed consumption or dissaving when income is zero.

Consumption, saving and Income

Now we can see how consumption and saving are determined for different values of income. We can also see the values of saving at the break even point. For this go back to table 1. and add the saving column. Table 1 was constructed on the basis of the consumption function equation $C = 500 + 0.5 \, Y$.

Now add, saving function as S = – 500 + 0.5 Y. Construct Table 2, showing values

Notes

of consumption and saving for various level of income. Then check the remark column.

Table 26.2: Consumption, Saving and Income

Time	Y	C	S	Remark
1	0	500	– 500	C > Y, S < 0
2	500	750	– 250	C > Y, S < 0
3	1000	1000	0	C = Y, S = 0 (BE)
4	1500	1250	250	C < Y, S > 0
5	2000	1500	500	C < Y, S > 0

As given in the table 2 above, when Y = 0, C is equal to a positive constant 500 (i.e. a). So saving is – 500. When Y increase, C and S both increase. At Y = 1000, C = Y = 1000 which is called break even as already told. At the break even point, Saving is zero. After that, when Y further increases, C falls bellow Y as per psychological law of consumption. When C becomes less than Y, automatically saving becomes positive. For example at Y = 1500, C = 1250 So, S = 250 and at Y = 2000, C = 1500, S = 500 and so on.

INTEXT QUESTION 26.3

1. Name two factor influencing consumption behaviour in the economy?

2. If MPC = 0.8 and fixed consumption 'a' is 200, write the saving equation.

3. APC = 1– MPS. True of False

4. MPS = 1 – APS. True of False

5. MPC = 1 – MPS. True of False

6. Given income as 500 and consumption as 300, find out APC?

7. Change in income is 150.

   Saving changes from 200 to 280.

   Find out MPS.

8. At break even point , consumption equals zero. True or False.

26.5 INVESTMENT

Investment is a basic economic activity in the economy. This activity is carried out by the firms or producers in the economy. Investment is defined as addition to the

existing capital stock. Capital stock include fixed assets such as land, building, machinery and equipment etc and change in stock.

Investment by firms can be expressed in two ways:

(i) Gross investment and (ii) Net investment.

Gross investment is defined as sum of net investment and depreciation. Gross investment = net investment + Depreciation.

It should be mentioned that in order to produce goods and services in the economy for the purpose of consumption, producers or firms need to invest in machinery, equipment, land, building etc and stock of raw material and finished goods. Also due to normal wear and tear, these items loose their value over time period. Hence a producer must spend on depreciation charges against wear and fear of machinery.

The difference between gross and net investment is called depreciation. We can write

Gross investment – Net investment = Depreciation.

Nature of investment

In macro economics investment can be categorised as autonomous and induced.

Autonomous investment is that part of investment which is fixed and most needed to carry out production activity. It is independent of the level of income or value of output generated in the production process. Expenditure on land, building or machineries needed for production can be treated as constant or fixed as they are required to start production. It can be also treated in the same way as fixed consumption told earlier.

Symbolically autonomous investment can be written as

$$I = I_0$$

where   I = investment

I_0 = Autonomous investment which is constant.

For example, let a firm wants to produce garments. For this the minimum requirement is a room and sewing machine. Whatever the level of output or income, expenditure on purchasing a room and sewing machine will be taken as autonomous investment. Say this amount is Rs. 20,000. Then autonomous investment is Rs 20,000.

The diagram for autonomous investment is given as a horizontal line as given below in Fig. 26.4.

Notes

Investment (I)

30000 –

20000 –   I

10000 –

50000   100000   Income (Y)
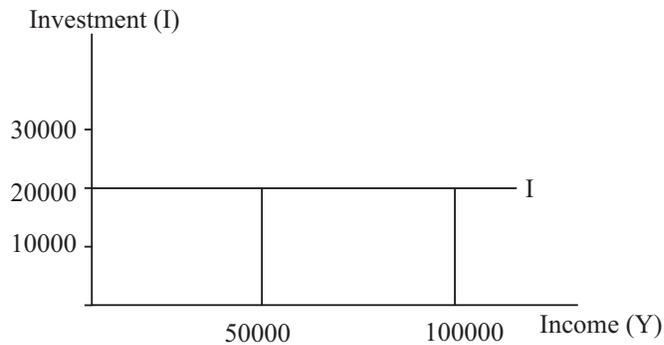
Fig. 26.4

Take investment on vertical axis and income on horizontal axis. In the diagram the autonomous investment line is horizontal at the value 20,000. This means that whatever be the level of income i.e. be it 0, or 50,000 or 100,000, investment will always remain 20,000.

On the otherhand induced investment is that part of investment by firms which is influenced by the level of income and profit motive. It may so happen that when income of firm increases, the firm gets encouragement to increase its business activity and accordingly invest more in capital stock. Hence it is called induced investment.

INTEX QUESTIONS 26.4

1. Autonomous investment is independent of the level of income. True or false

2. Induced investment in influenced by level of income. True of False.

WHAT HAVE YOU LEARNT

● Consumption function gives a direct reltionship between consumption and income.

● According to psychological law of consumption, Consumption increases at a comparatively slower rate than increase in income.

● Consumption function equation in the short run is given as

$C = a + b\,Y$

where a = positive constant

$b = MPC =$ and $b < 1$.

Y = Income

- Saving function is given as

  $S = -a + (1-b)Y$

  where $1-b = MPS$.

- $APC + APS = 1$ and $MPC + MPS = 1$.

- Consumption and saving functions are upward stoping.

- At break even point consumption and income are equal while saving is zero.

- Rate of interest, wealth, distribution of income and consumer credit affect propersity to consume.

- Autonomous investment is independent of the level of income while induced investment depends on the level of income.

- Gross investment = Net investment + depreciation.

TERMINAL EXERCISE

1. Define consumption function. Relate it with saving function.

2. State and exlain psychological law of consumption?

3. Give the relationship between propensity to consume and save?

4. What are the factors that influence propensity to consume? Discuss.

5. What do you mean by break even point? Compare consumption and income before and after that point. Also compare level of saving before and after the break even point.

6. If $a = 60$, $MPC = 0.75$ then write down the consumption and saving equations. Find the value of consumption and saving when income is 200.

7. Distinguish between autonomous and induced investment?

8. Draw the diagram of consumption function and saving function and explain these diagrams?

9. Fill in the blanks in the table

Y	C	S	APC	MPC	APs	MPS
0		−50				
100				0.5		
200						

10. Distinguish between gross and net investment?

🔒 **ANSWER TO INTEXT QUENTIONS**

26.1

1. (b)   2. 400   3. (c)   4. $\dfrac{5}{7} = 0.71$ 5. $\dfrac{3}{10} = 0.33$

26.2

1. C = 100 + 0.75 y,   2. C = 210   3. MPC,

4. False,   5. C

26.3

1. Wealth and distribution of income

2. $5 = 200 + (1-0.8)y = 200 + 0.2y$

3. False,

4. False

5. True

6. $\dfrac{3}{5} = 0.6$

7. $\dfrac{8}{15} = 0.53$

8. False

26.4

1. True

2. True.

27

THEORY OF INCOME DETERMINATION

Economy must produce goods and services and generate income for its citizens. For this it must provide employment opportunities. In this context it is important to ask the question "How much output should be produced in the economy?" What should be the level of income and employment?" John Maynard Keynes a famous economist who pioneered the study of macro economics in the 1930s has propounded a simple theory of income and employment to answer these questions.

OBJECTIVES

After completing this lesson, you will be able to:

- know the meaning of aggregate demand, aggregate supply and effective demand of an economy;

- tell the components of aggregate demand;

- determine the equilibrium level of income and employment;

- understand the concept and working of multiplier;

- distinguish between excess demand and deficient in demand; and

- expalin the methods to correct exces demand & deficient demand.

27.1 MODEL OF A SIMPLE ECONOMY

When We talk about the determination of income and employment in an economy the first step is to define the aggregate demand function of the economy. Here we assume that the economy is operating in the short run.

27.1.1 The Concept of Aggregate Demand

Aggregate demand of an economy is defined as the total demand for goods and services at the given price level.

Price are given or fixed because in a short run period prices of goods and services do not change.

A measure of aggregate demand is the aggregate expenditure incurred by the different consuming sectors of the economy on consumption of goods and services at the prevailing price level.Now the Questions arises –

Who are the consuming sectors in the economy? It must be noted that the economy's total product is used for final consumption as well as for further production. Accordingly, we can identify the following consuming sectors

1. Household

2. Firm

3. Government

4. Rest of the world

Aggregate demand consists of the demand for goods and services by theses sectors taken together.

Let us discuss these components of aggregate demand separately.

1. Household Consumption Demand

The household sector of the economy consists of individuals and families and non-profit organization who serve the households. These entities consume final goods and services for satisfaction of wants. Individuals and families demand both durable and non-durable goods. Examples of durable goods are, T.V., Refrigerator, Washing machine, Car, Scooter. Motorbike, Furniture, etc. Non-durable goods include food and non-food items. Cereals, pulses, vegetables, fruits etc. are food items whereas cloth, shoes, cosmetics , fuel. etc. are part of non-food items . All these goods are demanded by the households.

The non-profit organizations serving the household sector include charitable trusts, religious foundations etc., who demand goods and services to serve the household sector. They do not do business to earn profit. For example, a trust to serve the differently abled people demand various goods such as office stationeries, furniture. Vehicle etc. Such consumption is a part of household consumption demand.

Notes

2. Producers or Firm's Investment Demand

The firms and or the producers demand goods and services for further production. The demand for goods by the firms to produce a product is known as "Investment". Firms demand capital goods such as machinery and equipment. They also demand intermediate goods for further production. Purchase of wheat floor to produce bread by a bakery unit is an example of intermediate good or Secondary Inputs. Water, electricity, raw materials etc used for product in one examples of intermediate consumption.

3. Government Expenditure

The Government constitutes an important sector which purchases goods and services for the benefit of public. So, all purchases made by the government are intermediate purchases. The Government provides services such as law and order, defence, education and health etc. To provide these service, the government functions through various ministries and departments. To maintain these offices. The government purchases uniforms, vehicles, stationary, furniture etc. It spends money on payment of salaries to its employees. In this way, government expenditure constitutes a sizeable part of the aggregate demand.

4. Purchases by Rest of the World

We are living in the era of globalization where in countries are linked to each other through trade and transfers. A country which has got economic relation with another country is called an open economy. In an open economy, the foreign countries, which have economic relationship with the domestic country constitute the rest of the world. The way the households of the domestic country demand goods and services inside the country, in the same way the foreigners also purchase goods and services from the country from outside. This is called import of the rest of the world or export of the domestic country. However, since the households, firms and government of the domestic country also purchase goods and services from abroad which are called imports from rest of the world. Net export is calculated by deducting the imports of domestic country from abroad from its exports to rest of the world. Exports minus imports are called net exports . Net export is the measure of demand for goods and services by the rest of the world in the domestic Country.

Now we can write that aggregate demand is the sum of demands by households firms, and government and rest of the world. Let us express household demand as consumption, firms' demand as investment, government demand as government purchases and demand of rest of the world as net exports. Then, we can say that aggregate demand is the sum of consumption, investment, government purchases and net exports.

We can also write systematically :

$$AD = C + 1 + G + NX \qquad ...(1)$$

Where, AD = aggregate demand

C = consumption

I = investment

G = Government purchases

NX = net exports

NX = X – M, Where X = Exports, M = Imports

AD is also called aggregate expenditure in the economy.

Determining equilibrium level of income

The first step in determining the equilibrium level of income in an economy is to estimate its aggregate demand. The aggregate demand in an open economy is given in equation above.

To develop a simple model, let us assume that there are two sectors in the economy - households and firms. The demands of other two sectors such as government and rest of the world can be assumed to be given for the time being.

In such a case. The aggregate demand will be the sum of consumption and investment. Symbolically in a two sector economy,

AD = C + I.   where AD = Aggregate demand

27.2 CONDITION OF EQUILIBRIUM

The equilibrium income of the economy is determined at the point where aggregate demand equals the value of total output.

It can be said that actual value of total output is same as the economy's income. Let it be denoted as Y. It is also said that income is divided between consumption and saving.

So,   Y = C + S.

where S = Saving

So according to condition of equilibrium it can be written that:

$$AD = Y \qquad ...(2)$$

Or, $C + 1 = C + S$ $\qquad ...(3)$

Or   I = S   (4)

In an economy, the equilibrium level of income is determined at the point where aggregate demand equals total output and investment equals saving.

INTEXT QUESTIONS 27.1

1. Aggregate expenditure is a measure of aggregate demand . True / false.

2. What is the difference between exports and imports of an economy called ?

3. Whose demand is called final demand for goods and services.

   (a) Firms   (b) Government

   (c) Households   (d) Rest of the world

4. The condition for equilibrium income is given as

   (a) C = S   (b) C + I = C + S

   (c) C + S = S + 1   (d) S = Y

27.2.1 Diagramatic Representation

The equilibrium level of income can be presented using diagram. First, We have to make the diagram of aggregate demand which is the sum of consumption and investment in a two sector economy. You have already seen the diagram of consumption and investment functions in the previous lesson. We will use both these diagrams to construct the diagram of C + I as -given below.
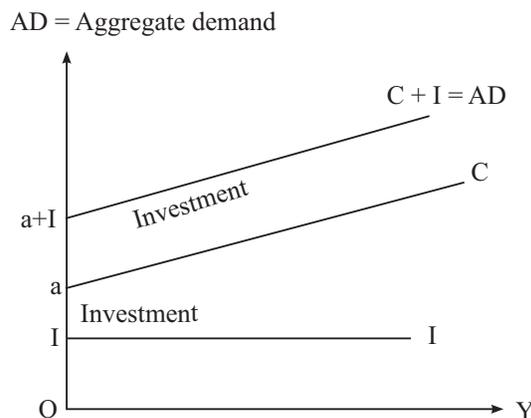

Fig. 27.1

In the previous lesson we said that the consumption function starts from point a on the vertical axis where Oa a is in the measure of fixed consumption. Then from

point 'a' the consumption function slopes upwards at a rate equal to MPC. It is also mentioned in the previous lesson that investment is fixed or autonomous . Hence, when we add investment with consumption function. then automatically fixed consumption and fixed investment will he added so that C + I will start from point a + I where 0 to a + I will be the measure of autonomous expenditure by both households and firms taken together.

Equation of C + I:

Note that, as said earlier, C = a + by

And, 1 is a fixed amount.

So, $$C + I = a + bY + I$$

$$= (a + I) + bY \qquad \qquad ...(5)$$

Where b = MPC

It is seen clearly that when consumption function (C) starts from a, the aggregate demand (C + 1) starts from (a + I) which is above C by an amount equal to investment (I). Both C and C + I slope upwards at a rate equal to b or MPC. Hence C and C + I are parallel to each other.

27.2.2 The Significance of 45° line

The value of output is same as level of income Y. Also Y is the sum of C and S or Y = C + S. Geometrically on a 45 degree line through the origin Y = C + S when we measure income Y along horizontal axis and C + S along vertical axis. It should be noted that on a 45 degree line C + S = Y because it divides the plane into two equal parts, See diagram, below.
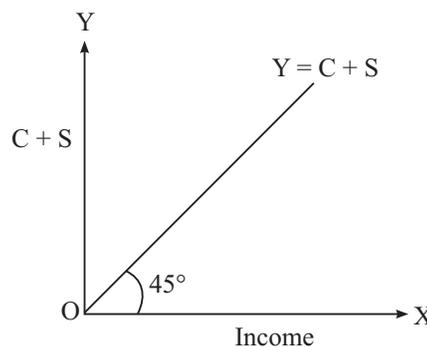
Fig. 27.2

27.2.3 Diagram for Equilibrium Income

To determine the equilibrium level of income , we can bring the above two diagrams of C + I and 45 degree line, together in one diagram as given below.

Notes
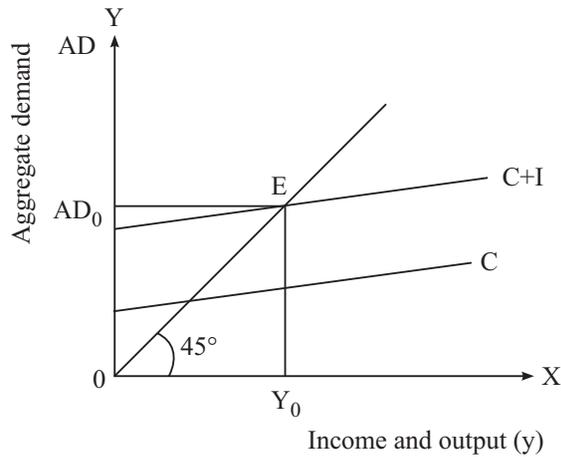
Fig. 27.3

As shown in the diagram above the aggregate demand line shown as C + I cuts the 45 degree line at point E. So E is the point of equilibrium where C + I = C + S. Drop perpendicular from point E on both the axis. The perpendicular cuts the horizontal axis which shows income an at point Yo. Hence the equilibrium level of income is determined at point Yo. OY_0 is the measure of equilibrium level of income. The level of aggregate demand that matches the measure of equilibrium income is determined at point. AD_0 on the vertical axis. The distance 0 to ADo (aggregate demand) equal the distance OYo (equilibrium level of income).

Equilibrium income by saving and investment approach

The equilibrium level of income can be determined by using saving and investment approach. Recall that, we have given the equilibrium condition as

$$C + I = C + S$$

This implies that I = S

Hence whenever aggregate demand equals total output, saving also equal investment. This means that the point at which saving and investment are equal refers to the equilibrium level of income. See diagram below
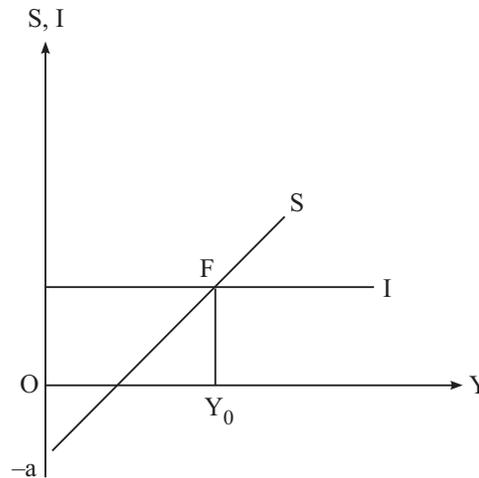
Fig. 27.4

In the Fig 27.4, income (Y) is measured along the horizontal axis. Saving and investment is measured along the vertical axis. The investment curve is shown as a horizontal line I indicating that investment is autonomous or fixed at all levels of income. The saving function is upward sloping starting from $-a$, below the origin, (see the lesson on consumption saving and investment). Both S and I curves cut each other at point F where $S = I$. From the point F drop a perpendicular on income axis (horizontal axis) to get the level of equilibrium income which is labelled as Y_0. Note that both the equilibrium level of income Y_0 shown in diagrams Fig. 27.3 and Fig. 27.4 are same.

It should be noted that in the economy people who save may be different from people who invest. So saving and investment equilibrium is not automatic or natural. It so happens that people plan to save certain amount but ends up in saving different amount. In other worlds planned saving may be different from actual or realised saving. The difference in planned and actual amount could be due to unexpected changes in prices in the market and changes expectations of households etc. Similarly, firms may plan to invest certain amount in assets but may end up in procuring asset which are different in value as planned earlier. This difference arises due to increase or decrease in price of assets (machinery and equipment) availability of loan from banks etc. So planned and realized investments may or may not always equal. Keynes has termed "planned" as "exante" and "realised" as "expost".

Accordingly we have exante saving and investment and export saving and investment. Below the level of equilibrium income i.e. Y_0, there is excess demand as $I > S$. Similarly above Y_0 there is excess supply situation as $S > 1$. Because of excess demand or excess supply in the economy price level, expectations of people fluctuate. So exante and expost items are not equal. At the equilibrium level of

income Y_0, there is neither excess demand nor excess supply. Hence exante and expost saving and investment are equal at equilibrium level of income.

27.2.4 Concept of Effective Demand

According to Keynes who gave the theory of equilibrium income, the point E in figure 27.3 is the point is the point of effective demand. In other words effective demand in the economy refers to the point where aggregate demand equals the level of output in the short run given the price level. This implies that the equilibrium level of income reflects the effective demand in the economy.

INTEXT QUESTIONS 27.2

1. What is the difference between aggregate demand and consumption is called ....?

2. The rate at which aggregate demand increases is known as ....?

3. Differentiate between aggregate demand (AD) and Effective demand (ED) ?

27.3 MULTIPLER AND ITS WORKING

Every economy wants to increase its level of equilibrium income every year. You know that increase in income is a manifestation of economic growth which is necessary to raise the standard of living of the population. To achieve this, the economy must increase the level of investment. Increase in investment is expected to bring about multiple increase in income. This means that increase in income has to be more than increase in investment In such a case, increase in income can be expressed as the product of some numerical value greater than one and the increase in investment. So take an example, Let investment in the economy increases from 100 crores to 150 crores, increase in investment is 150-100 = 50 crores. Let us expect that level of income increases by 100 crores. Since $100 = 2 \times 50$, it can be said that increase in income is equal to two times the increase in investment. Given the increase of investment the number which is multiplied with it is called multiplier. In this example multiplier is 2.

27.3.1 Definition of Multiplier

In the above example we can say that the multiplier 2 which is derived by dividing 100 crores by 50 crores. This mean $2 = \dfrac{100 \text{ crores}}{50 \text{ crores}}$

We can put this symbolically. Here 100 crores is the increase in income . Denote it as ΔY. Denote 50 crores, which is increase in investment, as ΔI. The multiplier 2 can be denoted as k . Then we can write that

Multiplier $k = \Delta Y/\Delta I$

Hence, multiplier is defined as the ratio of increase in Income to increase in investment. Using this equaiton we can also write that

$$\Delta Y = k\Delta I$$

This implies that increse in income is equal to multiplier times increase in investment. Here value of k holds key to increase in income given the value of increase in investment.

If K = 1. Then $\Delta Y = \Delta I$

This means that increase in investment brings about same amount of increase in income. If $k > I$ (k is greater than I) then, increase in investment will bring about higher increase in income than itself. We always expect that multiplier should be greater than 1, so that increase in income will be higher than that of investment which can be termed as profitable.

27.3.2 Derivation of the Value of Multiplier

In the above example if value of multiplier becomes 3 then increase in income will be 3×50 crores = 150 crores. If multiplier becomes 4, then increase in income will be still higher at 4×50 crores = 200 crores. Higher value of multiplier is always desirable. What determines the value of multiplier ? You know that firms make investments and give employment to produce goods and services and sell them in the market. They expect that consumers should demand their product so that they get higher return which will result in higher level of income. This implies that consumption demand is the important factor in influencing the level of income. As already said in the lesson on consumption, saving and investment, consumption demand is itself influenced by marginal prosperity to consume (MPC) out of income of the household consumers. So, higher the MPC, hither will be consumption demand for goods and services produced by firms who have made investment to produce them. Higher consumption will push the revenue or income of these firms upwards. So, multiplier which is multiplied by the increase in investment is determined by MPC. Higher value of MPC will make multiplier higher and vice versa. It is also said earlier that MPC is written as 1-MPS. If the value of MPS is small, then MPC is large. Hence, multiplier is higher if MPC is higher or MPS is lower. Similarly if MPC is lower or MPS is higher, then multiplier will be lower.

To derive the value of multiplier involving MPC or MPS we can use the condition for attaining the equilibrium income as follows:

$$C + I = C + S$$

Since, $\qquad C + S = Y,$

so $\qquad$ C + I = Y

Multiply Δ through out to get

$\qquad$ ΔC + ΔI = ΔY

Divide all through by ΔY to get

$$\frac{\Delta C}{\Delta Y} + \frac{\Delta I}{\Delta Y} = \frac{\Delta Y}{\Delta Y}$$

We know that $\dfrac{\Delta C}{\Delta Y}$ = MPC

Notes

Then $\qquad$ $MPC + \dfrac{\Delta I}{\Delta Y} = 1$

or $\qquad$ $\dfrac{\Delta I}{\Delta Y} = 1 - MPC$

Reversing both sides we get

$$\frac{\Delta Y}{\Delta I} = \frac{1}{1 - MPC} = \frac{1}{MPS}$$

Since $\qquad$ $\dfrac{\Delta Y}{\Delta I}$ = k or multiplier, we can write

$$\text{Multiplier K} = \frac{1}{1 - MPC} \text{ or } \frac{1}{MPS} \qquad (6)$$

Using the value of multiplier we can write that

$$\Delta Y = \frac{1}{1 - MPC} \times \Delta I \text{ or } \frac{1}{MPS} \times \Delta I$$

Example : If MPS is 0.2 and investment increases by ₹ 200 crores what is the increase in income ?

Answer: $\qquad$ $\Delta Y = \dfrac{I}{MPS} \times \Delta I$

$$= \frac{1}{0.2} \times 200$$

$= 5 \times 200$

$= ₹ \ 1000$ crores

So, increase in income is ₹ 1000 crores

Example: Given that MPC is 0.75 and investment increases from ₹ 100 crores to ₹ 150 crores. Find out value of multiplier and increase in income ?

Ans: multiplier $= \dfrac{1}{1 - \text{MPC}}$

$$= \dfrac{1}{1 - 0.75}$$

$$= \dfrac{1}{0.25} = 4$$

Increase in income is given as

$$\Delta Y = \dfrac{1}{1 - \text{MPC}} \times \Delta I$$

$$= 4 \times (150 - 100)$$

$$= 4 \times 50$$

$$= ₹ \ 200 \text{ crores}$$

Example 3: Due to increase in investment from ₹200 crores to ₹ 280 crores, income increased from ₹1000 crores to ₹1240 crores. What is the value of multiplier ?

Ans : Multiplier $= \dfrac{\Delta Y}{\Delta I}$

$$= \dfrac{1200 - 1000}{280 - 200}$$

$$= \dfrac{240}{80} = 3$$

So value of multiplier = 3.

Notes

27.3.4 Working of Multiplier

It is found that given the value of MPC and increase in investment the increase in income can be determined. For example, if MPC = 0.5, $\Delta I = ₹100$ crores then

$$\Delta Y = \frac{1}{1-0.5} \times 100 = 2 \times 100 = 200.$$

Here. we can ask a question, whether the increase in income is realized immediately or does it take place through various rounds? Infact we can show that the increase in income by ₹200 crores actually takes place through various rounds in the following manner:

Here, $\quad \Delta Y = \dfrac{1}{1-0.5} \times 100$ crores

The multiplier. $\dfrac{1}{1-0.5}$ has the common ratio 0.5 which is less than 1. Using formula for geometric progression we can write that.

$$\frac{1}{1-0.5} = 1 + 0.5 + (0.5)^2 + 0.5^3 \ldots\ldots$$

Hence, $\quad \dfrac{1}{1-0.5} \times 100$ crores can be written as

$$= (1 + 0.5 + (0.5)^2 + (0.5)^3 + \ldots\ldots\ldots) \times 100 \text{ crores}$$

$$= 100 + 0.5 \times 100 + (0.5)^2 \times 100 \ 0.5^3 + \ldots\ldots$$

$$= 100 + 50 + 25 + \ldots\ldots$$

$$= 200$$

$$= \frac{1}{1-0.5} \times 100 = \text{Rs } 200 \text{ crores}$$

or $\quad\quad\quad\quad 2 \times 100 = 200$

We can present the above sequence in a tabular manner.

Table : Working of Multiplier

Taking above example:

Rounds	ΔI	ΔY
1.	₹ 100 crores	₹ 100 crores
2.	...	₹ 50 crores
3.	...	₹ 25 crores

Explanation: When investment increases by ₹ 100 crores, aggregate demand (AD) increases by ₹ 100 crores since investment is a part of AD. But at the point of equilibrium AD = Y. So, income also increases by ₹ 100 crores in the first round i.e.

This also implies that $\Delta AD = \Delta Y$.

$\Delta Y = 100$ crore in the first round.

In the second round, consumption increases due to increase in income. Since MPC = 0.5 and $\Delta Y = ₹ 100$ crores

Increase in consumption or $\Delta C = MPC \times \Delta Y = 0.5 \times 100 = ₹ 50$ crores.

As a result of increase in consumption by ₹ 50 crores AD also increase by ₹ 50 crores as consumption is part of AD. But AD = Y at equilibrium, (so $\Delta AD = \Delta Y$, as said above). Hence in the second round increase in income is ₹ 50 crores. So after two rounds increase in income or $\Delta Y = 100 + 50 = ₹ 150$ crores.

In the third round, increase in consumption or $\Delta C = MPC \times \Delta Y$ of second round. So $\Delta C = 0.5 \times 50$. But $50 = 0.5 \times 100$. Hence $\Delta C = 0.5 \times (0.5 \times 100) = (0.5)^2 \times 100 = ₹ 25$ crores.

Increase in consumption again leads to increase in AD and finally increase in income by ₹ 25 crores in the third round. So, after three rounds, total increase in income = 100 + 50 + 25 = ₹ 175 crores.

This way increase in income takes place through initial increase in investment and latter by increases in consumption through various rounds till It equals

$$\frac{1}{1-MPC} \times \Delta I \qquad \text{or} \qquad k \times \Delta I$$

INTEXT QUESTIONS 27.3

1. If MPS = 0.5, what is multiplier ?

2. If MPC = 0.8, what is multiplier?

3. If increase in investment is ₹ 50 crores and income increases from ₹ 1000 crores to ₹ 1200 crores then find out multiplier?

4. If MPC is more then multiplier is less.   True/false

5. If MPS is higher, then multiplier is lower   True/false

6. Given that MPC = 0.8 and increase in investment is ₹ 100 crores find out increase in consumption in the second round ? What is total increase in income after two rounds?

27.4 EXCESS DEMAND

You learnt that equilibrium level of income is determined at the point where aggregate demand (AD) equals the level of output (Y). Let us assume that the level of output is at the maximum possible level or potential level which is achieved by full utilization of the resources of the economy. This means that the economy output will not increase beyond the potential level. You also learnt that increase in AD through increase in investment , brings about increase in income. or output due to working of multiplier. Now think of a situation in which the economy is already operating at its potential level of output and there is increase in investment at that level. What will happen? Will the level of output increase further?

The answer is that the economy's output will not increase. However due to increase in investment, which is a type of fixed or autonomous expenditure, the aggregate demand (AD) will increase and exceed the level of potential output. Such a situation is called excess demand in the country.

So. excess demand refers to the situation when aggregate demand exceeds the potential level of output in the economy.

The result of excess demand is inflation in the economy. The reason is obvious. When people have more money to demand more goods and services while the supply of output is less than this, then the price level will rise to balance the demand and supply forces.

Diagrammatically excess demand is created when AD line shifts upwards at the level of equilibrium as shown in the diagram below.
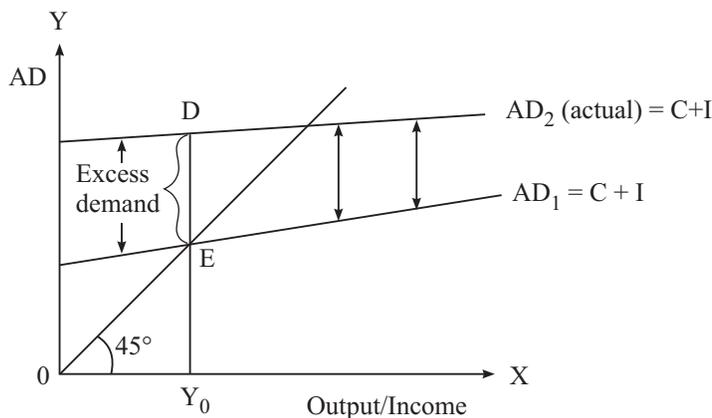
Fig. 27.5

In the diagram, it is shown that the equilibrium position is at point E, where aggregate demand line AD_1 meets 45 degree line. Let the economy be at equilibrium level of income. Now let aggregate demand increases from AD_1 to AD_2 due to increase in fixed investment or consumption. As a result a gap to the extent of DE is created which is the difference between the new and old aggregate demand. Here the income is not increasing beyond Y_0 after increase in AD. So the gap DE is the measure of excess demand in the economy. This gap is also called inflationary gap.

27.5 DEFICIENCY IN DEMAND

Deficiency in demand is exactly opposite to excess demand situation. When the economy is at its potential level and there is a fall in aggregate demand due to fall in autonomous consumption or investment, then it is called deficiency in demand. At this situation the output level seems to be in surplus in the market and people do not demand it thus putting pressure on price level to fall in order to balance the demand and supply forces. This creates deflationary pressure in the economy where deflation implies fall in prices of goods and services.

Diagrammatically, deficiency in demand is shown by the fall in AD line at the level of potential output as shown below in diagram.
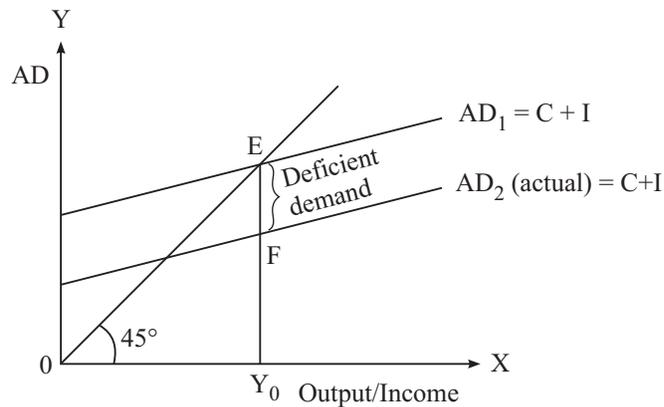
**Fig. 27.6**

In the diagram, equilibrium income is determined at point E where original aggregate demand, AD_1 cuts 45 degree line. The corresponding income at Yo is the potential level. Now at this level, AD_1 falls to AD_2 creating a gap EF without any fall in output. EF is the measure of deficiency in demand. This gap is also called deflationary gap.

Notes

Measures to correct excess and deficiency in demand:

Both inflation and deflation are bad for the society. Inflation reduces the purchasing power of the people so that they are not able to purchase the quantity they want causing reduction in their level of satisfaction. Poor and middle income group are worst affected by rise in the price level. Similarly, producers are worst affected by fall in prices or deflation. Their profit level falls due to fall in prices forcing them to reduce investment. This further causes employment level to fall. So the whole society gets badly affected by deflation.

Hence it is necessary to control inflation and deflation both. The measures or policies, implemented by the government to tackle these problems include:

(i)   Fiscal policy

(ii) Monetary policy.

(i) Fiscal policy

Fiscal policy is the economic policy of the government that is concerned with (a) taxation (b) public expenditure and (c) public borrowing. The government uses fiscal policy to control the rising prices or deal with the situation of deflation. In case of inflation or excess demand situation the government can exempt the poor people from paying income tax and reduce the burden of tax on the middle class by increasing the limit of income level to be exempted from income tax.

At the same time government can increase the tax burden on the rich class who are capable of paying higher amount of tax. In case of tax on commodities, the government can tax the luxury items heavily, while reduce the taxes on necessary and normal goods extensively used by the population.

Along with taxation policy, the government must reduce public expenditure and public borrowing to control excess demand. Reduction in public expenditure and public borrowing reduces the supply of money thereby reducing inflation.

In case of deficiency in demand the government must increase its expenditure and borrowing to boost the economy. Public expenditure include expenditure on welfare of people, creation of infrastructure, investments to generate employment opportunities etc. For this government can borrow money to finance these schemes.

(ii) Monetary policy

The monetary policy is implemented by the country's central Bank. In case of India, it is the Reserve Bank (RBI) which implements monetary policy.

Monetary policy refers to credit control measures used by the central bank to regulate and control the level of credit creation by commercial banks. Too much

of credit supply by commercial banks crates excess demand in the economy while lack of credit facilities results in fall in money supply and deflation or deficiency in demand in the economy. Monetary policy aims at controlling the excess or deficiency in demand.

The following are the instruments of monetary policy.

(i)   Bank rate

(ii)   Open market operation

(iii) Variable reserve ratio

Bank rate is the rate at which the central bank discounts the securities of the commercial banks. It is also the rate at which commercial banks borrow money from the control bank. To check excess demand, the central bank increases the bank rate in order to control the borrowing capacity of the commercial banks so that they do not indulge in distribution of loans to the customers. As a result credit supply is checked. On the other hand, the central bank can decrease the bank rate to cure deflation.

Open market operation refers to buying and selling of securities by central bank. Normally the commercial banks are the buyers of such securities.

During inflation (excess demand situation) the central bank sells government securities to commercial banks in returns of money. As a result money supply in the economy falls causing prices to fall. During deflation, the central bank will buy back the securities by paying money to the commercial banks thus causing money supply to rise which cures deficiency in demand.

Certain percentage of the value of the asset of the commercial bank is kept as reserves in the central bank called variable reserve ratio. To central excess demand, the central bank will increase the variable reserve ratio. So, that commercial banks have to a part with larger amount of their asset with the central bank. This will reduce their ability to supply more money in the society. To tackle deflation, the central bank will decrease the variable reserve ratio which will have the opposite effect.

(Also see monetary policy in lesson 28).

A major reason of excess demand in the economy is increase in credit supply by banks in anticipation of creation of more output in future Increase in credit or money supply creates immediate increase in demand for goods and services and thus rise in prices. Similarly fall in credit or money supply creates deficiency in demand as people do not have enough money to buy goods and services leading to fall in price.

INTEXT QUESTIONS 27.4

1. Excess demand creates inflationary pressure.   True/false

2. Deficiency in demand leads to increase in price   True/false

3. Increase in money supply creates excess demand .   True/false

4. Decrease in credit supply leads to deflation   True/false.

5. Tax policy is a part of monetary policy. True or false.

6. Public expenditure should be increased to cure deflation.   True or false.

7. Reduce public borrowing to cure excess demand.   True of false.

8. Bank rate must be increased to allow increase in money supply.True or false.

9. Open market operation is a fiscal policy instrument.   True or false.

Notes

WHAT YOU HAVE LEARNT

● The components of aggregate demand are household consumption demand, investment by firms, government expenditure and net exports.

● The equilibrium level of income is determined at the point where aggregate demand equals total output in the economy. symbolically. $C + I = C + S$ in a two sector economy.

● The point at which $C + I = C + S$ is also called effective demand.

● Multiplier is defined as the ratio of increase in income to increase in investment.

● Multiplier= $1/1 – MPC = 1/MPS$

● Increase in income = multiplier × increase in investment

    Or $\Delta Y = 1/1 – MPC × \Delta I$

● Multiplier process involves increase in income through various rounds due to initial increase in investment and subsequent increases in consumption.

● Excess demand refers to increase in aggregate demand at potential level of output.

● Excess demand creates inflationary pressure in the economy.

● Deficiency in demand refers to fall in aggregate demand at the level of potential output.

● Increase in money supply creates excess demand in the economy, excess demand is also called inflationary gap.

- Decrease in money supply creates deficiency in demand in the economy. Deficiency in demand is also called deflationary gap.

- Excess and deficiency in demand can be corrected by using fiscal and monetary policies.

- Fiscal policy is the policy of the government with respect to taxation, public expenditure and public borrowing

- Excess demand (deficiency in demand) can be corrected by decreasing (increasing) public expenditure and public borrowing.

- Monetary policy is the policy of the central bank to control credit creation of commercial banks. The instruments of monetary policy are bank rate, open market operation and variable reserve ratio.

- Excess demand (Deficiency in demand) can be corrected by increasing (decreasing) bank rate, selling (buying) securities in the open market and increasing (decreasing) variable reserve ratio.

TERMINAL EXERCISE

1. Discuss the various components of aggregate demand in brief'?

2. Explain determination of equilibrium income in a two sector economy ? Give diagram.

3. Define multiplier and derive its value ?

4. Explain the working of multiplier through various rounds?

5. Define excess demand. Explain it by using suitable diagram?

6. Define deficiency in demand? Explain it by using suitable diagram?

7. What do you mean by effective demand? Use a suitable diagram to show it?

8. What are the components of fiscal policy?

9. How are they used to curb excess demand in the economy

10. What are the instruments of monetary polices? How are they used to cure excess demand in the economy

11. Explain the role of fiscal on monetary policies to check deficiency in demand?

ANSWERS TO INTEXT QUESTIONS

27.1

1. True

2. Net exports

3. Household

4. (b)

28.2

1. Investment

2. MPC

3. AD = C + I, ED in the point where C + I = C + S

27.3

1. 2

2. 5

3. 4

4. False

5. True

6. ₹ 80 crores, ₹ 180 crores

27.4

l. True

2. False

3. True

4. True

MODULE - XI
MONEY, BANKING AND GOVERNMENT BUDGET

28

MONEY AND BANKING

Money is one of the most important discoveries of the human civilization. It is difficult to think about the world without money. Everybody needs money for various purposes; starting from day – to – day transactions to saving for future. But if you go back to history, you will find that before money came into existence there was barter system to facilitate transactions among individuals in the society. With development of civilization over time, barter system lost its ground and was replaced by money.

OBJECTIVES

After completing this lesson, you will be able to:

- know the meaning and limitations of barter system;

- understand the need for money;

- define money;

- explain the functions of money;

- tell the different measures of money supply in India;

- know the concept of High Powered Money;

- explain the meaning and functions of commercial banks;

- understand the process of credit creation;

- explain the meaning and functions of central bank; and

- know the methods of credit control.

28.1 FAILURE OF BARTER SYSTEM AND THE NEED FOR MONEY

In ancient days when there was no money, people used to exchange goods for goods to satisfy their wants without the use of money. Such a system was called barter system. However with passage of time the barter system had to be abandoned because of its inherent problems. Some of the demerits of barter system are as follows:

1. Search Cost

A common problem of barter system was that, one had to spend a lot of time in searching for the person who is willing to exchange the good at the given terms and conditions. In the early period of human civilization, this was a very difficult task as there was no proper facility with regard to transport and communication.

2. Lack of double coincidence of wants

A common problem with the barter system is the lack of double coincidence of wants which means that if one wants to exchange some good with another person then the latter must also be willing to exchange his/her good with the former. For example, let a person wants cloth and he has stock of wheat with him to exchange for it. In such a case the person can exchange wheat for cloth with another person who has cloth and who also wants wheat. In practical life, such situation may or may not arise. If the person who has cloth does not want wheat, then exchange of wheat for cloth will never take place and both the individuals cannot satisfy their wants. This is an example of lack of double coincidence of wants. So barter system will work when there is double coincident of wants, otherwise it will not work.

3. Lack of division of goods

Certain goods are not physically divisible into small pieces. Suppose, a person possesses a buffalo and he wants items, such as food grains. Then how much of buffalo can be traded for food grains? It was very difficult to determine because, a buffalo cannot be divided into several pieces.

4. Lack of common unit of measurement

Under barter system, it was difficult to equate the values of different goods which were traded because of lack of common unit of measurement. Taking the example in the previous paragraph, it will be very difficult to determine the amount of buffalo required to trade for some specific amount of food grains. Also it sounds absurd. This happens because a buffalo can never become a common measure of value. This problem is same for all other goods.

Notes

5. Problem of Storage

Another problem of barter system is that a person must store a large volume of his own good in order to exchange for his/her desired goods with others on day to day basis. Take the example of a farmer who has produced wheat. Obviously, he will use some amount of wheat for his own consumption and keep some amount to get other necessary items by trading with others. If he wants furniture, then he will go to a carpenter who is willing to trade furniture in return of his wheat. Similarly, if he wants cloth, then he has to trade with a weaver who is ready to give cloth by receiving wheat and so on. So the farmer must construct a warehouse first to keep a stock of his wheat in order to carry out the transactions at the time of need for his desired good. But constructing and maintaining a warehouse was itself a very difficult task in early days of civilization.

6. Loss of Value

Finally, a major problem of barter system is that, a good looses its original quality and value if it is stored for a long period. Many goods, such as salt, vegetables etc., are perishable. Hence, goods were never accepted for trading in future because they could not be used as store of value. This also implies that no good could be used for the purpose of lending and borrowing.

Due to above problems, the barter system could not continue for long. As human civilization progressed, people realized that there has to be some common medium of exchange which can be easily carried, stored, and used to express the value of a good. So money came into being. Hence the need for money arose due to the failure of barter system.

INTEXT QUESTIONS 28.1

1. Under barter system a good was exchanged for coins.   (True or False)

2. Simran wants to have 6 pencils in exchange of a note book from Kavita. But Kavita is not agreeing to this condition. The problem may be related to lack of double coincidence of wants.   (True or False)

3. Ahmed took 10 kg of rice from Asghar last year as loan. Now he is willing to return the same. But Asghar is not accepting it. Give one possible reason for it.

28.2 MEANING OF MONEY

Money has been defined differently by different economists. But the most acceptable definition of money can be stated in terms of all the functions of money.

Money is anything which is generally accepted as a means of exchange, a measure and store of value and which also acts as standard of deferred payments.

28.3 FUNCTIONS OF MONEY

The use of money has removed the drawbacks of barter system. Broadly speaking the functions of money may be classified into *primary (basic)* and *secondary* functions.

Primary or Basic Functions:

(i) Medium of Exchange

Money acts as a medium of exchange of all goods and services. The use of money has greatly facilitated process of exchange by dividing it into two parts i.e. sale and purchase. It has removed the difficulty of double coincidence of wants found under the barter system. Therefore, in modern world we hardly find any evidence of exchange of goods and services without the use of money.

Example: You pay ₹ 10 to buy a pen. The seller receives ₹ 10 from you by selling the pen. So a pen is exchanged for ₹ 10.

(ii) Measure of Value

Money helps to measure value of goods and services in terms of price. The use of money has completely removed the confusion regarding value of one good/service vis-a-vis the other. This function has greatly facilitated the process of exchange of different goods and services. The value of a good is determined by multiplying its price with the quantity purchased. Since the price is expressed in monetary units, the value of a good is also expressed in monetary terms.

Example: Let price of rice be ₹ 20 per Kilogram. One bag full of rice weighs 25 Kilograms. Then the value of the bag of rice is ₹ 20X25= ₹ 500

Secondary Functions:

(i) Store of Value or Wealth

Money is the most convenient and economical means to store wealth which does not lose its value so quickly over time. Thus, it is the most accepted means to store wealth or value. As medium of exchange you can pay money to buy goods. This means if you have money, you have the power to purchase a good or a service. So money has purchasing power. The value of the good is contained in that purchasing power. Hence value of good is indirectly stored in money, you hold. Similarly, as a seller of good, you receive the money which means value of good you sold, comes back to you through money.

Example: Harpreet sells furniture to a buyer for ₹ 2500.This means a value of ₹ 2500 was exchanged. The buyer, who purchased the furniture, has the

purchasing power to give ₹ 2500 as value. Hence a value of ₹ 2500 was stored in the money received by Harpreet as a seller. Harpreet could not have stored furniture but she can definitely store money which in turn has stored the value of ₹ 2500.

(ii) Standard of Deferred Payments

Deferred payments are those payments which are promised to be made in future. Money acts as a means of deferred payments mainly because it has general acceptability. Its value remains relatively constant over time and it is more durable as compared to other goods. In case of borrowing and lending activities only money is normally acceptable to be paid at a future date. Goods loose their value over time and due to possibility of lack of double coincident of wants they are not acceptable to settle debts in future.

(iii) Transfer of Value

This function of money is derived from the store of value function of money. Money is used to transfer value from one place to another or from one person to another. As a traveller when you move from one place to another, you can easily carry money to make necessary transactions on the way and in your destination place. You can also transfer the money through bank. Now people carry ATM card and withdraw cash wherever the facility is available.

Other functions of Money

(i) Distribution of National Income

Income is generated by the factors of production engaged in the production process. The factors are land, labour, capital and entrepreneurship. For the supply of these factor services to the production units, the supplier of labour gets wage, the supplier of land gets rent, the supplier of capital gets interest and the supplier of entrepreneurship gets profit. It should be noted that wage, rent, interest and profit are paid by the firms in money terms and received by the respective suppliers as factor incomes. Thus national income is measured by using income method.

(ii) Liquidity and Uniformity of Value

Money can be easily carried and is easily divisible into smaller units as per convenience. The liquidity feature of money is manifested at the time when it can be withdrawn from the bank account repeatedly in certain amount in each transaction. For example, your father has ₹10,000 deposited in his bank account. You want to purchase a shoe worth ₹600. Your father can withdraw the amount from the bank to give you. The balance of ₹9,400 will remain in your father's account.

Money brings uniformity in value of different goods and services which are not comparable physically due to their differences in the units of measurement.

For example a Kg. of rice and a liter of cooking oil cannot be added together as these are given in different units. But they can be added together if expressed in monetary units. If a Kg. of rice is worth ₹25 and a liter of cooking oil is worth ₹75, the combined value of rice and oil comes out to be ₹100.

28.4 MEASURES OF MONEY SUPPLY IN INDIA

Money supply refers to the total quantity of money held by public in various forms at any point of time in an economy. The main components of money supply are currency held by the public and net-demand deposits held by the commercial banks. The money supply in Indian economy is generally measured in following forms:

(i) M_1 = Currency (notes and coins) with the public + Demand deposits + other deposits held with the Reserve Bank of India.

(ii) M_2 = M_1 + Post Office saving deposits.

(iii) M_3 = M_1 + Time deposits of all commercial banks and co-operative banks (excluding interbank time deposits).

(iv) M_4 = M_3 + Total deposits with the Post Office Saving Organisation (excluding National Saving Certificate).

Of all the concepts of money supply stated above, M_1 is referred to as *narrow measure* and M_3 the *broader measure* of money supply. M_1 is the most important measure of money supply. M_1 is most liquid whereas M_4 is least liquid.

28.5 HIGH POWERED MONEY (H)

The HighPowered Money refers to the currency held by the public (C), cash reserves of banks (R) and other deposits of the R.B.I. High Powered Money is produced by the R.B.I. and the Government of India and held by the public and the banks.

INTEXT QUESTIONS 28.2

1. Which of the following statements are true and which are false?

   (i) M_1 is a narrow measure and M_3 is a broader measure of money supply.

   (ii) Currency notes and coins are not an important component of money supply.

   (iii) Supply of money is measured over a period of time.

   (iv) High powered money consists of cash with public, reserves with banks and other deposits with R.B.I.

(v) Government has no role in producing high powered money in an economy.

28.6 COMMERCIAL BANKS

Meaning: The commercial bank is a financial institution which is primarily concerned with accepting deposits from public and lending to the public besides others. These banks operate both under the public as well private sectors. Some public sector banks include the State Bank of India, Punjab National Bank and Bank of India among others. The private sector commercial banks may include the banks namely HDFC bank, ICICI bank and HSBC bank among others.

Functions of Commercial Banks: The commercial banks normally perform the following functions in an economy:

(i) **Acceptance of deposits:** Every commercial bank accepts deposits from different sections of society including the general public, business entities and other institutions. Commercial banks accept following types of deposit:

- **Current Account Deposits or Demand Deposits:** This type of account is generally maintained by the business entities and money under these deposits are payable on demand of the depositor. The depositors are free to deposit or withdraw money from their account any number of times without any restrictions.

- **Savings Account Deposits:** This type of account is generally maintained by the households or individuals. The depositor can deposit or withdraw money deposited under this account only for a limited number of times. This account also attracts a nominal rate of interest payable to the account holder.

- **Fixed Deposit or Time Deposit or Term Deposit:** Under this account money is deposited for a fixed period and the rate of interest is relatively higher than other accounts depending on the tenure of the fixed deposit.

(ii) **Extending Loans and Advances:** This is another important function of a commercial bank. This is also the main source of income of any commercial bank. Banks grant loans and advances out of the surplus money after keeping certain percentage of their total deposit called as reserves. Some important forms of loans and advances are *ordinary loans*, *overdraft facility* and *discounting of bills of exchange*.

(iii) **Creation of Credit:** This function is derived from the earlier two functions of the commercial banks. This unique function has direct impact on the supply of money in an economy.

(iv) Transfer of Funds: The banks provide the facility of fund transfer to its customers through the instruments of cheque, demand draft or electronic transfer from one place to another or one person to another.

(v) Agency Functions: Banks receive and collect different types of payments on behalf of their clients through the instruments of cheques, drafts, bills and promissory notes etc. Banks also buy and sell gold, silver and other securities on behalf of their customers.

(vi) Sale and Purchase of Foreign Exchange: This is another important function of a commercial bank which has increased tremendously with increasing volume of international trade particularly in the era of globalization.

(vii) General Utility Services: In modern days the banks also perform some very useful functions for the benefit of its customers and the economy like collection and publication of data, advisory functions, issue of lockers and underwriting of loans, shares and debentures issued by the government.

28.7 CREATION OF CREDIT BY COMMERCIAL BANKS

Credit creation is one of the most important functions of a commercial bank. Banks create credit out of the deposits that is mobilized by them. Credit creation is also called money creation or deposit creation. Therefore, commercial banks are also known as creator of money or credit.

The process of credit/money creation: Money is not created by commercial banks by actually printing of notes or minting of coins. The money is created by granting loans and advances to public and making relevant entries into the books of accounts of the lending banks. Loans are granted out of the deposits received by the banks. Normally, the amount of loan granted by a bank is greater than the amount of deposits received by it. This is mainly because of the fact that when money is deposited by the depositors in a bank, the bank by its experience knows that not all the money would be withdrawn by the depositors at once at any point of time. This peculiar habit of the depositors leaves the bank with huge amount of surplus fund which in turn is used to create loans by the banks. The banks keep certain proportion of its total deposits in form of cash to honour the demand of its customers. Further, every commercial bank is required to keep certain proportion of its total deposits with the R.B.I. which is known as *Cash Reserve Ratio* (CRR). Besides CRR, the bank is also required statutorily to maintain certain proportion of its total deposits as liquid assets in form of cash, gold, and certain government approved securities. This is known as *Statutory Liquidity Ratio* (SLR). The CRR and SLR together form the *Legal Reserve Ratio* (LRR) which is determined by the central bank of a country (R.B.I. in case of India). When LRR is increased by the central bank the capacity of the commercial banks to create deposit or credit decreases and when LRR is decreased the capacity to create more credit increases.

Thus, there exists an inverse relationship between LRR and the quantity of money created in an economy. Given the quantity of deposits and LRR at any point of time, the total quantity of money created in an economy during a given period of time would be as follows:

Total quantity of money created: Quantity of deposits × 1/LRR. Let us understand the process of money or credit creation in an economy with the help of an example. Let us assume that the bank receives an initial deposit of ₹ 1000 and the LRR is 10%. It means the bank has an excess reserve of ₹ 1000 – (1000 x 10%) = ₹ 900 to lend to the borrowers. It must be noted that the borrowers are not paid the amount of loan as cash but the same is credited in their account. Thus in the first round an extra deposit of ₹ 900 is created out of which the bank is free to advance loan worth ₹ 900 – (900 × 10%) = ₹ 810. In the second round an extra deposit of ₹ 810 is created and the total amount of money in the economy becomes ₹ 1000 + 900 + 810 = ₹ 2710. If the process continues the total amount of money created in the economy with ₹ 1000 would be ₹1000 × 1/10% = 1000 × 1/0.1 = ₹ 1000 × 10 = 10,000 (Ten Thousand). If the amount of LRR is 20% then the initial deposit of ₹ 1000 would create the total amount of money in the economy worth ₹ 1000 × 1/0.2 = ₹ 5000 (Five Thousand). **Thus, a higher LRR would create less amount of money and a lower LRR would create a higher amount of money in the economy.**

It should further be noted that only a fraction of total deposits is kept as cash reserves by banks because of two reasons. *First*, Banks by their experiences know that all depositors are not going to withdraw their money at the same time so the surplus money could be used to create loans and extra deposits. *Second*, there is a continuous flow of deposits in the banks, so banks are comfortable with their cash reserves.

INTEXT QUESTIONS 28.3

1. Which of the following statements are true and which are false?

    (i) Commercial banks are controlled and operated only by the public sector.

    (ii) Rate of interest on savings account deposits is less than fixed deposits.

    (iii) Functions of commercial banks are rising day by day in modern economy.

    (iv) Overdraft facility is an important form of granting loan to the public by banks.

    (v) Increase in legal reserve ratio reduces credit creating power of commercial banks.

Notes

28.8 CENTRAL BANK

Central Bank is an apex bank in an economy which is entrusted with the task to control, regulate and supervise the entire banking operations of all the commercial banks including formulation and implementation of monetary policy in the economy. The central bank of India is Reserve Bank of India (R.B.I.).

Functions of Central Bank

(i) **Bank of issuing or currency:** Every central bank of an economy is the sole authority to issue currency. The currency issued by the central bank is backed by minimum receive of assets like gold coins, gold bullions and foreign exchange etc. kept with the central bank. The Minimum Reserve System in India represent the minimum backing of Rs 200 crores by RBI out of which Rs 115 crores worth of gold and Rs 85 crores worth of foreign exchange securities are kept under RBI, the Monetary Authority of India. The authority of sole issue of currency has certain benefits like uniformity in currency, better monitoring and control over money supply and public trust and confidence in the currency issued and circulated.

(ii) **Banker to the banks:** The central bank acts as a banker to the commercial banks in the following manner:

- Custodian of the cash reserves of the commercial banks (CRR).

- Lender of the last resort in the sense that if commercial banks fail to generate enough cash from its own sources it approaches the central bank as a last resort. The central bank in turn may grant loans and advances to the needy banks.

- The central bank also acts as central clearing house for the commercial banks.

(iii) **Banker to the government:** As a banker to the government the central bank carries out all banking businesses on behalf of both the central government and the state governments. It maintains current account of the government for keeping cash balances and also making and receiving payments on behalf of the government. It provides loans and advances to the government. It also acts as financial advisor to the government.

(iv) **Custodian of the stock of gold and foreign exchange reserves of the nation:** This function helps in maintaining stability in exchange rate as fixed by the government and also enforcing exchange control and other regulations for a favourable balance of payments for the economy.

(v) **Controller of credit and money supply:** Credit control and control of money supply is probably the most important function of a central bank. Through various methods/instruments of credit control the central bank aims

to achieve growth with stability in an economy. All the instruments of credit control may broadly be divided into following two categories. These are called instruments of monetary policy. Monetary policy is the policy of the central bank to control and regulate money supply and credit in the economy.

(A)   Quantitative methods of credit control and

(B)   Qualitative or selective methods of credit control.

The Quantitative methods include those instruments which affect the total volume of credit and affect all sections of the economy. It includes the following instruments:

(i)   **Bank Rate Policy:** Bank rate is the rate at which central bank provides loan to the commercial banks. The increase in bank rate by the central bank increases the cost of funds to the commercial banks which in turn is passed on to their customers. High rate of interest reduces demand for loan and thus the quantity of credit/money in the economy which squeezes aggregate demand in the economy. Bank rate is increased to control inflation in an economy and it is reduced to fight deflationary situation in the economy.

(ii)   **Open Market Operations:** Open market operations refer to the policy of sale and purchase of government securities in the open market by the central bank. The central bank sells and purchases these securities mainly to and from the public and commercial banks. If the central bank wants to control inflation it sells securities in the market so that the excess liquidity may be transferred from public to the central bank. This measure controls the aggregate demand and inflation in the economy. The central bank starts purchasing securities in the market to boost aggregate demand and fight deflation in the economy.

(iii)   **Variable Legal Reserve Ratio:** The central bank can influence the credit creating power of commercial banks by varying CRR and SLR. Increase in LRR reduces credit creation capacity of commercial banks and decrease in LRR increases this power of the banks. LRR is increased during inflation and decreased during deflation.

The qualitative or selective credit control does not influence the quantity of credit/money in totality but it is directed towards controlling credit in a particular use of credit. The qualitative methods of credit control are as follows:

(i)   **Margin Requirements:** The commercial banks grant loan to borrowers against some collateral securities whose value is more than the the value of loans granted. The difference between the value of collateral securities and the amount of loan is called margin. Increase in margin requirement reduces loan eligibility of the borrower which central uses at the time of inflation. During deflationary situation margin requirement is reduced to promote the growth of volume of credit/money in the economy.

(ii) **Moral Suasion:** Under this method central bank persuades and pressurises the commercial banks to adopt a credit policy which is in line with the overall objectives of the economy.

(iii) **Credit Rationing:** Under this method central bank fixes maximum ceiling of loans to be granted by the commercial banks either on aggregate basis or for a particular use. The rate of interest may vary across sectors or uses.

INTEXT QUESTIONS 28.4

1. Which of the following statements are true and which are false?

   (i) Central Bank is an apex bank in an economy.

   (ii) Central bank has little role in controlling and regulating the operations of commercial banks.

   (iii) Central bank acts as banker to the government.

   (iv) Central bank plays an important role in controlling and regulating money supply in an economy.

   (v) Quantitative methods of credit control influences the overall supply of money in an economy.

   (vi) Increase in bank rate reduces supply of money in an economy.

   (vii) During inflation the central bank increases bank rate and during deflation it reduces the bank rate.

   (viii) During inflation the central bank starts purchasing securities in the market.

   (ix) Selective credit control measures influence supply of money only in some sectors of the economy.

   (x) Credit rationing is an important form of selective credit control.

WHAT YOU HAVE LEARNT

- Barter system is a system of exchange under which goods are exchanged for goods without the use of money.

- Barter system suffered from many difficulties like lack of double coincidence of wants, lack of common measure of value, absence of standard of deferred or future payments and difficulty and wastage in the storage of wealth.

- Money is anything which is generally accepted as a means of exchange.

- Money also acts as measure and store of value and as standard of deferred payments.

- There are four measures of money supply viz. M_1, M_2, M_3 and M_4 of which M_1 is a narrow measure of money supply and M_3 is broader measure of money supply.

- The High Powered Money is the currency held by public (C), cash reserves of banks (R) and other deposits of the R.B.I.

- Commercial bank is a financial institution which is primarily concerned with accepting deposits from public and lending to the public.

- Functions of Commercial Banks mainly include acceptance of deposits, extending loans and advances, creation of credit and sale and purchase of foreign exchange:

- Higher LRR reduces commercial bank's power to create credit and vice-versa.

- Total quantity of money created: Quantity of deposits x 1/LRR.

- Central Bank is an apex bank in an economy which is entrusted with the task to control, regulate and supervise the entire banking operations of all the commercial banks.

- Important functions of central bank include credit control, issue of currency, banker to the bank, custodian of the cash reserves of the commercial banks, lender of the last resort.

- Central bank also acts as central clearing house for the commercial banks, banker to the government, custodian of the stock of gold and foreign exchange reserves of the nation, controller of credit and money supply.

- Central bank broadly uses two categories of instruments of credit control viz. quantitative methods and qualitative or selective methods of credit control.

- Quantitative methods include bank Rate Policy, open Market Operations and variable legal reserve ratio.

- Qualitative or selective credit control includes margin requirements, moral suasion and credit rationing.

TERMINAL EXERCISE

1. What is barter system of exchange?

2. What were the difficulties of barter system of exchange?

3. Define Money.

4. How money could solve difficulties related to barter system?

5. Explain different measures of money supply.

6. What is a commercial bank?

7. Explain important functions of commercial banks.

8. What are different types of deposits accepted by commercial banks?

9. What is credit creation?

10. Briefly explain the process of money creation or credit creation.

11. What is high powered money?

12. What is central bank?

13. What are the important functions of central bank?

14. Distinguish between quantitative and qualitative methods of credit control.

ANSWERS TO INTEXT QUESTIONS

28.1

(i)   False   (ii) True

(iii)   Quality of rice may be lower/loss of interest.

28.2

(i)   True   (ii) True   (iii) False   (iv) True   (v) True

28.3

(i)   False   (ii) True   (iii) True   (iv) True   (v) True

28.4

(i)   True   (ii) False   (iii) True   (iv) True   (v) True
(vi)   True   (vii) True   (viii) False   (ix) True   (x) True

29

GOVERNMENT AND THE BUDGET

In India, government budget is normally presented in the Parliament in the month of February every year. Before the budget is presented, for many days there are speculations among people about the expected changes in various taxes. Are the rates of income tax going to be increased or decreased? Whether the price of petrol and cooking gas cylinders going to be left unchanged? All of us discuss these expected changes in budget because they affect our future expenditure on goods and services. However, this may give an impression that government budget is merely an exercise concerned with various taxes. But, in fact, government budget is much more than changes in taxes.

This lesson describes the structure of government budget and its objectives. In this lesson, you will learn about government budget and realize that it is more than mere changes in tax rates.

OBJECTIVES

After completing this lesson, you will be able to:

- understand the meaning of government budget;
- draw the structure of government budget;
- differentiate between revenue and capital receipts;
- differentiate between revenue and capital expenditure;
- differentiate between plan and non-plan expenditure;
- understand the meaning of revenue deficit, fiscal deficit and primary deficit;

Notes

- understand the ways to finance various deficits; and

- understand the meaning and objectives of budgetary policy.

29.1 WHAT IS GOVERNMENT BUDGET?

The budget of a government is a summary of the itemwise intended/expected revenues and anticipated expenditures of the government during a fiscal year/ financial year. In India the financial year spans from 1st April to 31st March over two calender years.

Government at all levels, whether central, state or a local level, prepare the budget. Budget is prepared, keeping in view the general policy of government towards the welfare of people.

Government incurs various expenditures to provide basic facilities such as education, health, etc. It also spends money to increase production, to reduce unemployment, poverty and inequalities in income and wealth etc. Such expenditure of government promotes welfare of the people. To finance this expenditure, government raises revenue from sources such as taxes, public debt, etc. These financial resources that fund government expenditure are raised from people.

The items of expenditure and the sources of financing them are planned by government in accordance with the objective of public welfare. Thus, government takes decisions on behalf of people with respect to how public money is to be spent under different heads of expenditures and how it is to be raised from various sources. This makes government accountable to people. Through legislatures, parliament and various other civic bodies, people exercise their right to know as to how government is spending public money and how it is raising it from them. This accountability of government to the people of the country is manifested in the government budget. **A budget is a consolidated financial statement prepared by government on expected public expenditure and public revenue during a financial year.**

There are three main features of a government budget. **One,** it is a consolidated financial statement of expected expenditures and various sources of revenue of government. **Two**, it relates to a financial year. And **three,** the expenditures and the sources of revenue are planned in accordance with the declared policy objectives of government.

29.2 STRUCTURE OF BUDGET

To understand the basic structure of budget and its various components, let us consider the budget of the Central Government of India for the financial years 2012-13 presented in **Table 29.1.** From this Table we find that the budget has two parts:

(1) **Receipts and** (2) **Expenditures.**

Table 29.1 : Central Budget: Receipts and Expenditures of the Central
Government (Rs. Crores)

		2012-2013 Actuals
1.	**Revenue Receipts**	**877613**
2.	Tax Revenue (net to centre)	740256
3.	Non-Tax Revenue	137357
4.	**Capital Receipts (5+6+7)**	**532754**
5.	Recoveries of Loans	16267
6.	Other Receipts	25890
7.	Borrowings and other liabilities	490597
8.	**Total Receipts (1+4)**	**1410367**
9.	**Non-Plan Expenditure**	**996742**
10.	On Revenue Account of which	914301
11.	Interest Payments	313169
12.	On Capital Account	82441
13.	**Plan Expenditure**	**413625**
14.	On Revenue Account	329208
15.	On Capital Account	84417
16.	**Total Expenditure (9+13)**	**1410367**
17.	Revenue Expenditure (10+14)	1243509
18.	Of Which, Grants for creation of Capital Assets	115513
19.	Capital Expenditure (12+15)	166858
20.	**Revenue Deficit (17-1)**	**365896** (3.6)
21.	**Effective Revenue** Deficit (20-18)	**250383** (2.5
22.	**Fiscal Deficit** (16-(1+5+6)}	**490597** (4.9)
23.	**Primary Deficit (22-11)**	**177428** (1.8)

(1) Receipts

The receipts of government show the different sources from which government
raises revenue. These receipts are of **two** kinds: (i) **Revenue receipts** and (ii)
Capital receipts.

Notes

Revenue receipts are current income receipts from all sources such as taxes, profits of public enterprises, grants, etc. Revenue receipts neither create any liability nor cause any reduction in the assets of the government. Capital receipts, on the other hand, are the receipts of the government which either create liability or cause any reduciton in the assets of the government. e.g. borrowings, recovery of loan and disinvestment etc.

It must be mentioned here that there is a similarity between the financing by an individual and the financing by a government. An individual, generally, finances his current expenditure from his current income. He borrows when his current income is not sufficient for his current expenditure. Likewise, a government has two sources to finance its expenditures: current income or revenue receipts and capital receipts. It borrows when revenue receipts fall short of its current expenditures. The dissimilarity between financing by an individual and that by a government is that an individual first estimates his current income and then plans his expenditures while a government plans its expenditures first and then finds the sources to finance them.

(1) Revenue Receipts

Revenue receipts are current incomes of government, which neither create liabilities nor cause any reduction in the assets of the government. These receipts are classified into (a) **Tax Revenue** and (b) **Non-tax Revenue.**

(a) Tax Revenue : A tax is a legal compulsory payment by the people and firms to the government of a country without reference to any direct benifit in return.. It is imposed on the people by the government. A government collects revenue from various taxes like income tax, sales tax, service tax, excise duty, custom duty etc. *Traditionally the revenue from taxes has been the primary source of government income.*

Income tax is imposed on those who earn income such as wages, salaries, rent, interest and profit. Sales tax is the tax on the sale of goods. Whenever we purchase a good, a part of our payment goes to the government as sales tax. Service tax is the tax we pay when we use a service such as telephone service. Excise duty is a tax paid by the producer manufacturing a good. Custom duty is paid when a good is imported or exported.

All taxes are of two kinds: (a) Direct taxes and (b) Indirect Taxes. This distinction between taxes depends on (1) the liability of payment of tax to government and (2) the actual burden of tax.

In case of *direct taxes,* the liability of payment and the burden of the tax falls on the same person. For example, income tax is a direct tax because the person who is liable to pay it also bears the burden of the tax; The burden of the tax cannot be shifted on others. But this does not happen in case of *indirect taxes.* For example,

Notes

in case of sales tax, although the liability to pay tax lies with the seller of a good, the actual burden of tax falls on the buyer. The buyer and not the seller is the one who finally pays the sales tax. The seller only collects the tax from the buyer by increasing the price and pays it to the government. Thus, we find that incase of sales tax, the burden of tax is shifted from the seller to the buyer. All taxes on production are indirect taxes because producers recover these taxes from buyers by increasing the price of the product.

Example of Direct Taxes

- Income tax: the tax on incomes of individuals

- Corporation tax : the tax on corporate profits

- Wealth tax: the tax on wealth of individuals

- Gift tax: the tax on gifts given

Example of Indirect Taxes

- Value added tax

- Excise duty: the tax on goods manufactured in factories

- Customs duty: the tax on imports and exports

- Service tax: the tax on the services provided

Difference between Direct Taxes and Indirect Taxes

S.No.	Basis	Direct taxes	Indirect taxes
1.	Impact	Direct taxes are levied on individuals and firms	Indirect taxes are levied on goods and services
2.	Shift of burden	The burden of a direct tax cannot be shifted, i.e. impact and incidence are on the same person	The burden of an indirect can be shifted, i.e. impact and incidence are on different persons e.g. a seller can increase the price of the good after tax is imposed so that the buyer will bear the burden of the tax.
3.	Nature	They are generally progressive in nature	They are generally proportionate in nature
4.	Coverage	They have limited reach as they do not reach all the sections of the society	They have a wide coverage as they affect all the sections of the society

Notes

(b) Non-Tax Revenue

The incomes accruing to government from sources other than taxes are *non-tax revenues.* The major sources of non-tax revenues of the central government of India are:

(i) Commercial Revenue: It is received by government in the form of prices paid by people for goods and services that government provides e.g. people pay for electricity and for services of Railways, postal stamps, toll etc.

(ii) Administrative Revenue: It arises on account of administrative services of the government. They are as follow:

    (a)   fees in the form of passport fees, government hospital fees, education fees, court fee, etc.

    (b)   fine and penalites: charged by government on law-breakers for disobeying rules and regulations.

    (c)   licence fee and permit

    (d)   Escheat : Income that government get by taking possession of property which has no legal claimant or legal heir.

    (e)   Interest receipts

    (f)   profits of public sector undertakings.

1. Capital Receipts

As stated earlier, capital receipts are those receipts of the government which either create liability or cause any reduction in the assets of the government.

The major sources of capital receipts of the central government are: (i) Borrowings (ii) Recovery of Loans and (iii) Disinvestment - Resale of shares of public sector undertakings.

(i)   Borrowings: There are two sources from which the central government borrows. They are:

    (a)   Domestic Borrowings: The government borrows from domestic financial market by issuing securities and treasury bills. It also borrows from people through various deposit schemes such as Public Provident Fund, Small Savings Schemes, and National Savings Scheme etc. These are borrowings of the government within the country.

    (b)   External Borrowings: In addition to domestic borrowings the government also borrows from foreign governments and international bodies like International Monetary Fund (IMF), World Bank etc. Foreign borrowings by the government bring in foreign exchange into the domestic economy.

(ii) **Recovery of Loans:** Quite often state and local governments borrow from the central government. The loans recovered by the central government from state and local governments are capital receipts in the budget because recovery of loans reduces debtors (assets).

(iii) **Disinvestment - Resale of shares of public sector undertakings:** This is a very recent source of capital receipts by which the central government has been mobilizing financial resources since 1991. Prior to 1991, the central government owned 100 percent of the shares of public sector undertakings. From 1991, the government adopted the policy of privatisation of public sector undertakings. Consequently, it started selling its shares to general public and to financial institutions. This selling of shares of public sector undertakings by the government is known as **'disinvestment of public sector undertakings'.**

Notes

2. Expenditure

Government expenditure is classified in two ways: **capital expenditure and revenue expenditure** and (b) as **plan expenditure** and **non-plan expenditure.**

Capital Expenditure and Revenue Expenditure

When government incurs expenditure to create assets such as school and hospital buildings, roads bridges, canals, railway lines etc., or reduce its liability such as repayment of loan etc., such expenditure is known as **capital expenditure.** But when government incurs expenditure that neither creates any asset nor reduces any liability, such expenditure is known as **revenue expenditure.** For Example, payment of salaries to government employees, maintenance of public property, providing free education and health services to people, etc constitute revenue expenditure. These do not create any public asset.

Plan Expenditure and Non-Plan Expenditure

After independence, our country adopted the path of planning to achieve economic development. Under planning, provisions were made in the government budget for expenditure that was to be incurred every year according to the priorities laid down in the five-year plans. Such expenditure is known as **plan expenditure.**

Beside plan expenditure, government also incurs routine expenditure such as expenditure on police, judiciary, water supply, sanitation and health, legislatures, defence, various government departments, etc. Such routine expenditure is termed as **non-plan expenditure.**

Notes

INTEXT QUESTIONS 29.1

Choose the correct alternative.

1. Government budget is a financial statement of

    (a) Actural expenditure and actual receipts

    (b) Expected expenditure and expected receipts

    (c) Expected expenditure

    (d) Expected receipts

2. Capital Receipts are

    (a) Taxes

    (b) Dividends

    (c) Profits

    (d) Borrowings, recovery of loans, grants from foreign countries

3. Revenue receipts are

    (a) Borrowings

    (b) Revovery of loans

    (c) Grants from foreign countries

    (d) Taxes, interest, dividends and profits from public sector undertakings

29.3 BALANCED BUDGET VERSUS DEFICIT BUDGET OR SURPLUS BUDGET

As explained above, government receipt and expenditure are the two components of a budget. In terms of the magnitudes of receipts and expenditure. We may have balance budget, deficit budget and surplus budget.

● When the government expenditure is exactly equal to its receipts, the government has balanced budget.

● When the government expenditure exceeds its receipts, it is deficit budget.

● When the government revenue is greater than its expenditure, the government runs a budget surplus.

Thus:

    Balance budget → Total Budgeted Receipt = Total Budgeted Expenditure

    Dificit budget   → Total Budgeted Receipts < Total Budgeted Expenditure

    Surplus budget → Total Budgeted Receipts > Total Budgeted Expenditure

There was a time when budget surplus was regarded as an index of a good budget. However, in modern economy budget deficit has become order of the day.

29.4 TYPES OF BUDGET DEFICIT

1. **Revenue Deficit:** It refers to the excess of total revenue expenditure of the government over its total revenue receipts.

   Revenue deficit = Total Revenue expenditure – Total Revenue receipts.

   OR

   Revenue deficit = Total Revenue expenditure – (Tax Revenue + Non Tax Revenue)

2. **Fiscal Deficit:** Fiscal deficit is defined as excess of total expenditure over total receipts excluding borrowings during a fiscal year.

   Fiscal deficit = Total budget expenditure – Total budget receipts excluding borrowings

   OR

   Fiscal Deficit = (Revenue expenditure + Capital expenditure) – (Revenue Receipts + Capital receipts excluding borrowings)

   Fiscal deficit shows the borrowing requirements of the govt. during the budget year. Fiscal deficit reflects the borrowing requirements of the govt. for financing the expenditure including interest payments.

   Fiscal deficit = Revenue expenditure + capital expenditure – Revenue receipts – capital Receipts excluding borrowings

   OR

   Fiscal deficit = Revenue expenditure + capital expenditure – Tax Revenue – Non Tax Revenue – recovery of loans – disinvestment

   OR

   Fiscal deficit = Total borrowing requirement of the government

   Fiscal deficit indicates the additional amount of financial resources needed to meet government expenditure. Two, it is an indicator of the increase in future liabilities of the government on interest payment and loan repayment. The government has to pay back the borrowed amount with interest in future. Consequently, the government has to either borrow more from the people or tax people more in future to pay interest and loan amount.

3. **Primary Deficit:** Primary deficit is defined as fiscal deficit minus interest payments on previous borrowings.

   Primary deficit shows the borrowing requirements of the govt. for meeting expenditure excluding interest payment.

   Gross Primary deficit = Fiscal deficit – Interest payments

Net Primary deficit = Fiscal deficit + Interest received – Interest payments

It shows the total amount that the central government needs to borrow.

Three Ways to Finance Deficit

There are **three ways** by which the central government finances deficit. These are:

(a) Borrowing from Public and Foreign Governments

(b) Withdrawing Cash Balances held with the Reserve Bank of India (R.B.I.)

(c) Borrowing from the Reserve Bank of India (R.B.I)

The Government ordinarily prefers to borrow either from its citizens or from foreign governments instead of withdrawing cash balances held with the R.B.I. or borrowing from it. The later two ways to finance deficit increase the supply of money. The increase in supply of money increases the prices in an economy. On the other hand, borrowing domestically from public has no effect on the supply of money and consequently on prices because when government borrows, the money held by people is transferred to government with no change in the supply of money. However, the money supply would increase when government borrows from foreign countries. The last two ways to finance deficit increase the supply of money. Any money that flows out of the R.B.I. increases the supply of money in economy and increases the prices in domestic economy.

29.5 BUDGETARY POLICY (FISCAL POLICY)

Now you will know about budgetary policy. Budgetary policy relates to two important issues. These are:

1. The items on which the government should spend

2. How the government should raise resources to finance its expenditure?

The answer to the first question will depend on the priorities of the government to solve various economic, social and other problems that a country faces. For example, if there is a constant threat of attack from another country, the government has no choice but to spend more on defence. If there is a threat of outbreak and spread of an epidemic, the government has to spend more on health services. If the government had taken loan in the past, it has to spend more on interest payments.

On the second question the government has to consider various ways to raise resources. Should the people be taxed more? Which section of the people to be taxed more? Which commodities are to be taxed? How much the government should borrow? From whom should it borrow and in what form? The answers to these questions are to be found in the policy objectives of the government.

The fiscal policy is concerned with the raising of government revenue and increasing expenditure. To generate revenue and to increase expenditures, the government finance or policy called Budgeting policy or fiscal policy.

The major fiscal measures are:

1. **Public Expenditure** – Government spends money on a wide variety of things, from the military and police to services like education and health care, as well as transfer payments such as welfare benefits.

2. **Taxation** – Government imposes new taxes and change the rate of current taxes. The expenditure of government is funded by the imposition of taxes.

3. **Public Borrowing** – Government also raises money from the population or from abroad through bonds, NSC, Kisan Vikas Patra, etc.

4. **Other Measure** – Other measures adopted by the government are:

   (a) Rationing and price control

   (b) Regulation of wages

   (c) Increase the production of goods and services.

Objectives of Budget and Budgetary Policy

1. **To promote economic growth:** Government promotes economic growth by setting up basic and heavy industries like steel, chemical, fertilizers, machine tools, etc. It also builds infrastructure like roads, canals, railways, airports, education and health services, water and electricity supply, telecommunications, etc. that foster economic growth.

   Both basic and heavy industries and infrastructure require huge amount of investment which normally the private sector does not take up. Since these industries and infrastructure facilities are essential for economic growth in the country, the burden to set up and develop them falls on the government.

2. **To reduce income and wealth inequalities:** Government reduces inequalities in income and wealth by taxing the rich more and spending more on the poor. Further, it provides for the employment opportunities to poor that help them to earn.

3. **To provide employment opportunities:** Employment opportunities are increased by the government in various ways, One, jobs are created when it sets up public sector enterprises. Two, it provides subsidies and other incentives like tax holidays, low rates of taxes etc. to private sector that encourage production and employment. It also encourages setting up of small scale, cottage and village industries by people which are employment oriented. This it does by providing them tax concessions, subsidies, grants, loans at low rates of interest, etc. Finally, it creates jobs for poor when it undertakes public works programmes like construction of roads, bridges, canals, buildings, etc.

4. **To ensure stability in prices:** Government ensures stability of prices of essential goods and services by regulating their supplies. Hence, it incurs expenditure on ration and fair price shops that keep sufficient stock of food grains. If also subsidizes cooking gas, electricity, water and essential services like transport and maintains their prices at low level affordable to the common man.

5. **To correct balance of payments deficit:** The balance of payments account of a country records its receipts and payment with foreign countries. When payments to foreigners are more than receipts from foreigners, the balance of payments account is said to be in deficit. Quite often this deficit is caused when a country imports more than it exports. Consequently, the payments on imports to foreigners are more than the receipts from exports. In such a situation, to reduce the deficit in balance of payment account, the government discourages imports by increasing taxes on them and encourages exports by increasing subsidies and other export incentives. However, it should be noted that tax on import is not a popular measure now as it is treated as an obstacle to free flow of goods and services between countries.

6. **To provide for effective administration:** Government incurs expenditures on police, defence, legislatures, judiciary, etc. to provide effective administration.

INTEXT QUESTIONS 29.2

Fill in the blanks with appropriate word(s) within the brackets.

1. Government budget is in deficit when total budgeted expenditure is .... total budgeted revenue.   (less than, greater than, equal to)

2. Fiscal deficit .... government borrowings.   (includes, excludes)

3. Budgetary deficit is .... measure of deficit compared to fiscal deficit.
                                                                (a better, not a better)

4. Money supply .... when government borrows from the Reserve Bank of India.   (decreases, increases)

WHAT YOU HAVE LEARNT

- Government budget is a consolidated financial statement relating to a financial year of expected item wise expenditures and expected revenue of government for fiscal year.

- The receipts in a government budget are of two types: (1) Revenue receipts and (2) Capital receipts.

- The sale of its own shares in public sector undertakings by government is known as 'disinvestment of public sector undertakings'.

- Government expenditure is classified as (1) Revenue and Capital expenditure and as (b) Plan and Non-Plan expenditure.

- Budget deficit is the excess of total budgeted expenditure over total budgeted receipts *net of borrowings*. It indicates the total borrowing requirement of government.

- Three ways by which the central government finances deficit:

    (i) Borrowings from public and from foreign governments.

    (ii) Withdrawing cash balances held with the Reserve Bank of India.

    (iii) Borrowings from the Reserve Bank of India.

- The selection of items of expenditure and sources of financing them in tune with policies and programmes of the government, is termed as the budgetary policy of government.

- The main objectives of budget and budgetary policy are:

    (i) to promote economic growth,

    (ii) to reduce income and wealth inequalities,

    (iii) to provide employment opportunities,

    (iv) to ensure stability in prices,

    (v) to correct balance of payments deficit and

    (vi) to provide for effective administration.

TERMINAL EXERCISE

1. What is a government budget? What do you understand by the term 'financial year'?

2. Outline the structure of government budget and briefly explain its various constituents.

3. Distinguish between revenue receipts and capital receipts.

4. Distinguish between revenue expenditure and capital expenditure.

5. Distinguish between plan and non-plan expenditure.

6. Distinguish between surplus budget and deficit budget. How do they limit the economic activity?

7. State the difference between fiscal deficit and budgetary deficit.

8. Why fiscal deficit is a better measure of deficit as compared to budgetary deficit?

9. What are the different ways to finance deficit in government budget? Explain them.

Notes

10. State the effects of government borrowing from public and from Reserve Bank of India. Which one is better and why?

11. State and explain the objectives of budgetary policy.

12. Explain the need of government budget.

ANSWERS TO INTEXT QUESTIONS

29.1

1. (b)   2. (d)   3. (d)

29.2

1. (greater than)   2. (excludes)   3.(not a better)   4. (increases).

MARKING SCHEME
ECONOMICS (318)
Sr. Secondary Course

Q. No.	Expected value points	Distribution of Marks	Total Marks
1.	[B]	1	1
2.	[C]	1	1
3.	[D]	1	1
4.	[A]	1	1
5.	[B]	1	1
6.	[A]	1	1
7.	[D]	1	1
8.	[C]	1	1
9.	[B]	1	1
10.	[C]	1	1

11.

Student No.	Rank in Maths	Rank in Statistics	D $(R_1 - R_2)$	D^2
1	1	3	−2	4
2	3	1	2	4
3	7	4	3	9
4	5	5	0	0
5	4	6	−2	4
6	6	9	−3	9
7	2	7	−5	25
8	10	8	2	4
9	9	10	−1	1
10	8	2	6	36
				$\Sigma D^2 = 96$

$$r = 1 - \frac{6\Sigma D^2}{N(N^2-1)} = 1 - \frac{6(96)}{10(100-1)}$$

$$= 1 - \frac{6 \times 96}{10 \times 99}$$

$$= 0.418$$

Q. No.	*Expected Value points*	*Distribution of Marks*	*Total Marks*
	Preparation of table	$1\frac{1}{2}$	
	Correct Calculate	1	
	Correct answer	$\frac{1}{2}$	3
12.	**'What to produce'**		
	The problem 'what to produce' is faced by all economies. An economy needs to choose whether it wants to use its resources to produce consumer goods or produce goods. Alternatively, to what extent should luxury goods be produced in comparision to necessities or goods of mars consumption? An economy may also be faced with the question of how much of civilian goods to be produced and how much of defence goods to be produced. In otherwords, scarce resources require economies to decide the combination of goods and services they should produce.		
	— To be marked as a whole.		3
13.	**Factors affecting price elasticity of demand**		
	(i) Availability of close substitutes: Demand for a commodity having large number of substitutes, is usually more elastic than those commodities which have no substitutes. For example, demand for coke is elastic because it has many substitutes like, Limka, Pepsi etc. On the other hand demand for electricity is inelastic because it has no substitute.		
	(ii) Nature of the Commodity: Demand for necessities like medicines, food grains, food etc. is less elastic because we have to consume them in minimum required quantity, whatever their price may be. But demand for comforts and luxuries like air-conditioners etc. is more elastic because their consumption may be postponed for future if their price rises.		
	—Or any other relevant point (any two)	$1\frac{1}{2}\times2$	3
14.	**Explicit Cost:**		
	All actual payments, on purchasing and hiring different goods and services in production are called explicit costs	1	
	e.g. wages of workers	$\frac{1}{2}$	

Marking Scheme

Q. No.	Expected Value points	Distribution of Marks	Total Marks
	Implicit Cost: Imputed value of the inputs supplied by the owner makes implicit cost of production. e.g. imputed rent of owner's own building	1 $\frac{1}{2}$	3

Quantity demanded and supplied
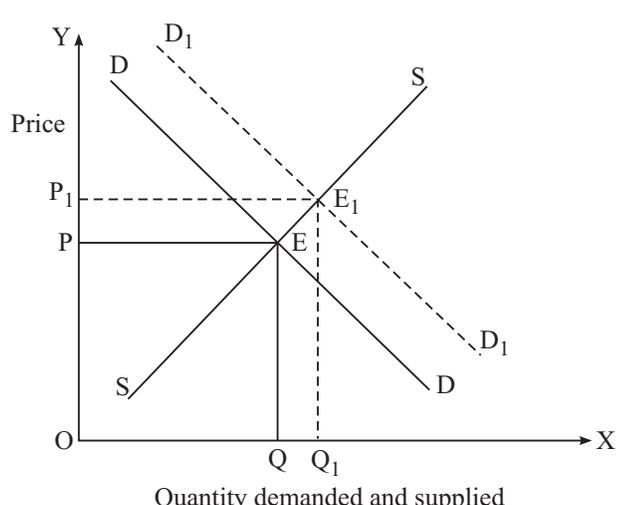
Q. No.	Expected Value points	Distribution of Marks	Total Marks
		1	
15.	Market equilibrium refers to a situation when at a given price quantity demanded of a commodity equals its quantity supplied.	1	
	When demand for the commodity increases, the demand curve shifts rightwards. As a result,		
	(i) Equilibrium price rises.		
	(ii) Equilibrium quantity demanded and supplied increases.	1	3
16.	Net value added at factor cost		
	= Sales + increase in stock–intermediate consumption		
	expenditure – depreciation – Net indirect taxes	1	
	= 3,000 + 10 – 1,000 – 50 – (25 – 5)	1	
	= ₹ 1940 thousands	1	3

Q. No.	Expected Value points	Distribution of Marks	Total Marks
17.	***Intermediate goods and find goods:***		
	Intermediate goods are those goods which are meant either for reprocessing or for resale.	1	
	e.g. raw material	$\frac{1}{2}$	
	Goods which are used either for final consumption or for investment are known as final goods.	1	
	e.g. bread used by a consumer	$\frac{1}{2}$	3
18.	$C = a + by$	1	
	$= 500 + 0.5 \times 2500$	1	
	$= ₹ 1750$ crores	1	
19.	***Revenue receipts***		
	Revenue receipts are current income of government, which neither create liabilities nor cause any reduction in the assets of the government.	1	
	e.g. revenue from income tax	$\frac{1}{2}$	
	Capital receipts are those receipts of the government which either create liability or cause any reduction in the assets of the government.	1	
	e.g. Recovery of loans.	$\frac{1}{2}$	3
20.	Fiscal deficit = Total budget expenditure − Total budget receipts excluding borrowings	1	
	$= (50 + 30) - (40 + 20)$	1	
	$= ₹ 20$ Arabs	1	3
21.	Issues that should be kept in mind for the construction of index numbers:		
	(i) Purpose of index members should be defined.		
	(ii) Only those items should be included which are related to and are relevant with the purpose.		
	(iii) It has to be decided first as to which average should be used for the construction of index numbers.		
	(iv) Proper importance has to be given to the items used for construction of index numbers.		
	— or any other relevant point (any four)	1×4	

Marking Scheme

Q. No.	Expected Value points	Distribution of Marks	Total Marks
22.	(i) Microeconomics relates to the individual economic levels while Macroeconomics is related to the study of the aggregates.		
	(ii) Microeconomics is concerned with problems and policies relating to the optimum allocation of resources while Macroeconomic analysis is concerned with the broadest level of policies pertaining to income, employment and growth of resources.		
	(iii) Microeconomics focuses on the price determination in the market for goods and services while Macroeconomics focuses on income determination in the economy as a whole.		
	(iv) Microeconomics analysis is based on the assumptions of 'other things being equal'. Whereas Macroeconomic analysis emphasises on full employment to provided resources.		
	— or any other relevant point (any four)	1×4	4
23.	In case of normal goods like full cream milk, demand increases when income of the buyer increases and demand for these goods decreases when income of the buyer decreases.		
	But in case of inferior goods like coarse rice, demand for these goods decreases when income of the buyer increases and their demand increases when income of the buyer decreases.	2 2	4
24.	$e_s = \dfrac{\Delta Q}{\Delta p} \times \dfrac{P}{Q}$	1	
	$= \dfrac{24}{2} \times \dfrac{10}{120}$	2	
	$= 1$	1	4
25.	**Features of Perfectly Competitive market**		
	(i) There is a very large number of buyers and sellers in a perfectly competitive market.		
	(ii) Industry is price maker and firm is price taker.		
	(iii) The product offered by different firms are homogeneous in every respect.		
	(iv) Firms are free to enter into the market or exit from the market at any point of time.		
	— or any other relevant feature (any four)	1×4	4
26.	Equilibrium level of national income is determined where C+I curve intersects 45° line, as explained in the diagram:		

Q. No.	Expected Value points	Distribu-tion of Marks	Total Marks

((Income level)

As shown in the diagram C + I curve intersects 45° line at point E. This means point E is point of equilibrium where C + I = C + S. Drop perpendicular from point E on both the axis. Equilibrium level of income is determined at point Y_o. OY_o is the measure of equilibrium level of income. The level of aggregate demand that matches the equilibrium level of income is determined at point AD_o.

1

3   4

27.

Marks Students	No. of (f)	Mid Points (m)	f_m	$d' = \dfrac{m - 35}{10}$	fd'
0 – 10	5	5	25	–3	–15
10 – 20	10	15	150	–2	–20
20 – 30	12	25	300	–1	–12
30 – 40	24	35	840	0	0
40 – 50	23	45	1035	1	23
50 – 60	14	55	770	2	28
60 – 70	8	65	520	3	24
70 – 80	4	75	300	4	16
	$\Sigma f = 100$				$\Sigma fd' = 44$

$$\bar{X} = A + \frac{\Sigma fd^-}{\Sigma f} \times C$$

$$= 35 + \frac{44}{100} \times 10$$

$$= 35 + 4.4$$

Q. No.	Expected Value points	Distribu-tion of Marks	Total Marks
	= 39.4 marks		
	for Preparation of table	3	
	for Correct Calculation	2	
	for Correct answer	1	6
28.	Lorenz Curve is a graphical method of studying dispersion. Lorenz Curve is a cumulative frequency curve showing the distribution of a variable against any independent variable.	1	
	Steps involved in drawing Lorenz Curve:		
	1. Find Cumulative totals of variables.		
	2. Estimate cumulative frequencies.		
	3. Express the cumulative mid-points and frequencies in percentages by taking reach of the sum total as 100.		
	4. Take the cumulative percentages of the variable on Y-axis and cumulative percentages of frequencies on X-axis. Each axis will have values from 0 – 100.		
	5. Draw a line joining co-ordinate (0, 0) with (100, 100). This is called the line of equal distribution.		
	6. Plot the cumulative percentages of the variable with corresponding cumulative percentages of frequency. Join these points to get the Lorenz Curve.	5	6
29.	Consumer's equilibrium refers to a situation when he gets maximum satisfaction and he feels no urge to change, subject to his income and market price of two goods.		
	A consumer will be in equilibrium, when:		
	(i) Budget line is tangent to the in difference curve $\left(\dfrac{P_X}{P_Y} = MRS_{XY} \right)$		
	(ii) MRS falls as more of one good is consumed in place of another good.		
	(i) **$MRSXY = \dfrac{P_X}{P_Y}$ or MRS = MRE:**		
	Suppose two goods consumed or *X* and *Y* and consumer wants to increase consumption of *X* in place of good *Y*. When *MRS* > *MRE*, it means to obtain one unit of *X*, the consumer is willing to sacrifice more units of *Y* than the market requires. This will lead		

Q. No.	Expected Value points	Distribution of Marks	Total Marks
	to increase in consumption of *X* but decrease in consumption of *Y*. *MRS* starts falling. He continues to consume more of *X* till *MRS* becomes equal to *MRE*.		

When *MRS* < *MRE*, it means, to get one more unit of *X*, the consumer is willing to sacrifice less unit of *Y* than the market requires. He will reduce the consumption of *X* and increase consumption of *Y*. *MRS* starts rising. He continues reducing consumption of *X* till *MRS* becomes equal to *MRE*.

Let us consider the following diagram:

Given the indifference map and the budget line, the consumer is at equilibrium at point *E*. He consumes OX_1 quantity of good *X* and *OY*, quantity of good *Y* to get maximum satisfaction. At this point budget line is tangent to the IC_2 (i.e. *MRS* = *MRE*). The consumer can buy bundles *C* and *D* but these bundles line on lower indifference curve IC_1 which represents lower level of satisfaction. He will like to consume bundle *G* lying of IC_3 but is beyond his budget.

(ii) **MRS falls Continuously:**

The condition ensures that if *MRS* is not equal to *MRE*, the falling *MRS* will lead to equality again, as explained in the first condition.

— To be marked as a whole. | 6

Q. No.	Expected Value points	Distribu-tion of Marks	Total Marks
30.	According to the law of variable proportions when more and more units of a variable factor are employed with fixed factor, the total output initially increases at an increasing rate but beyond a certain point, it increases at a diminishing rate and finally it falls. (Alternatively, Marginal product increases initially then it falls and ultimately it becomes negative.)		

There are three phases of returns to a variable factor:

(i) Phase I: Increasing Returns to a Factor

In this phase TP increases at an increasing rate and marginal product of the variable factor increases. At the end of this phase MP is maximum.

(ii) Phase II: Diminishing Returns to a factor:
In this phase TP increases at a diminishing rate and MP falls but remains positive. At the end of this stage MP is zero and TP is maximum.

(iii) Phase III: Negative Returns to a factor:
In this phase MP becomes negative and TP falls.

All the these phase can be explained through the following table:

Units of land	Units of labour	TP (units)	MP (units)	Phase
1	1	3	3	
1	2	7	4	I Phase
1	3	12	5	
1	4	16	4	
1	5	19	3	
1	6	21	2	II Phase
1	7	22	1	
1	8	22	0	
1	9	21	−1	III Phase
1	10	20	−2	

— or any other relevant table/diagram showing three phases

— To be marked as a whole.

Distribution of Marks / Total Marks: 6

Q. No.	Expected Value points	Distribution of Marks	Total Marks
31.	**(a) National Income**		
	NNP_{Fe} = (i) + (iii) + (v) + (vi) − (ii) − (vii) + (iv)		
	= 5,000 + 40 + 6,000 + 3,000 − 50 − 20 + 10		
	= ₹ 13980 Crores	3	
	(b) Gross national disposable income (GND1)		
	GND1 = GNPmp + net current transfers from ROW		
	= [NNPFc + (ii) + (vii)] + (viii)		
	= [13980 + 50 + 20] + 30		
	= ₹ 14080 crores.	3	6
32.	Exchange of goods for goods without the use of money is called barter system of exchange.	2	
	Demerits of barter system of exchange:		
	(i) Lack of double coincidence of wants:		
	Double coincidence of wants means that if one wants to exchange some good with another person then the latter must also be wiling to exchange his/her good with the former. The common problem with barter system is lack of double coincidence of wants.	$1\frac{1}{2}$	
	– Relevant example.	$\frac{1}{2}$	
	(ii) Lack of Common unit of measurement:		
	Under barter system, it was difficult to equate the values of different goods which were traded because of lack of common unit of measurement.	$1\frac{1}{2}$	
	— Relevant example	$\frac{1}{2}$	6

Final fold and seal

Feed back on Lessons

Lesson No.	Lesson Name	Content			Language		Illustrations		What You Have Learnt	
		Difficult	Interesting	Confusing	Simple	Complex	Useful	Not useful	Very helpful	Not helpful
12.										
13.										
14.										
15.										
16.										
17.										
18.										
19.										
20.										
21.										
22.										
23.										
24.										
25.										
26.										
27.										
28.										
29.										

----Fourth fold----

----Third fold----

Dear Learners,

You must have enjoyed going through your course books. It was our endeavor to make the study material relevant, interactive and interesting. Production of material is a two way process. Your feedback would help us improve the study material. Do take a few minutes of your time and fill-up the feedback form so that an interesting and useful study material can be made.

Thank you
Coordinator
(Economics)

Feed back on Questions

Lesson No.	Lesson Name	Intext Questions		Terminal Questions		
		Useful	Not useful	Easy	Diff.	V. diff.
12.						
13.						
14.						
15.						
16.						
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Second Fold

No Enclosures allowed

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Did you consult any other book to study Economics?   Yes/No

If Yes, give reason for consulting it
_____
_____

Yours suggestion
_____
_____
_____
_____

QUESTIONS PAPER DESIGN

Subject: Economics (318)
Senior Secondary Course

1. Weightage by Objectives

Objectives	Marks	% of the Total Marks
Knowledge	28	28%
Understanding	40	40%
Application	32	32%
Total	**100%**	**100%**

2. Weightage by Types of Questions

Type of Questions	No. of Questions	Marks of each Questions	Total Marks
Long Answer (LA)	6	**6**	36
Short Answers I (SAI)	6	4	24
Short Answers II (SAII)	10	**3**	30
MCQ	10	**1**	10
Total	**32**		**100**

3. Weightage to Difficulty Level of Questions

Estimated Level	Marks	Percentage of Marks
Difficult	20	20%
Average	50	50%
Easy	30	30%
Total	**100**	**100%**

4. Weightage by Content

S.No.	Module	No. of lessons	Marks
1.	Statistical Tools	04	20
2.	Introduciton to Economics	02	07
3.	Consumer's Behaviour	03	14
4.	Producer's Behaviour	04	15
5.	Market and Price Determination	03	07
6.	National Income Accounting	02	15
7.	Theory of Income and Employment	02	10
8.	Money, Banking and Government Budget	02	12
	Total	**22**	**100**

SAMPLE QUESTIONS PAPER
SENIOR SECONDARY COURSE
ECONOMICS (318)

Time: 3 Hours   Maximum Marks : 100

Instructions

1. All quesitons are compulsory.

2. Marks allotted to each quesiton are indicated against it.

Note: Each question from 1 to 10 has four alternatives A, B, C and D, out of which one is most appropriate. Select the correct answer and write in your answer sheet against the no. of questions.

1. The correlation co-efficient 'r' lies between: 1

   A. –0.5 to +1   B. –1 to +1

   C. –0.1 to 0.5   D. 1 to 2

2. Price elasticity of demand at the mid-point of a straight line demand curve will be   1

   A. < 1   B. > 1

   C. = 1   D. 0

3. A producer will be in equilibrium when: 1

   A. MC = MR   B. MR > MC

   C. MC > MR   D. MC = MR and MC > MR beyond MC = MR

4. TC is ₹ 100 and TFC is ₹ 20, TVC will be   1

   A. 80   B. 120

   C. 50   D. 5

5. The difference between domestic income and national income is of: 1

   A. Net indirect taxes   B. Net factor income from abroad

   C. Depreciation   D. Intermediate consumption expenditure

6. Gift is an example of: 1

   A. Transfer income   B. Factor income

   C. Compensation of employees D. Profit

7. Which one of the following is a stock concept: 1

    A. Growth of population   B. Loss

    C. Profit   D. Population

8. In an economy, the value of MPS is 0.2, the value of investment multiplier will be: 1

    A. 1.25   B. 2

    C. 5   D. 1

9. Total income is same as disposable income if: 1

    A. Consumption = 0   B. Tax and fines = 0

    C. Saving = 0   D. Income = 0

10. The distance betweeen 0, the origin and the point from which the consumption function starts
    on the vertical axis is a measure of: 1

    A. Saving   B. Income

    C. Fixed consumption   D. Disposable income

11. Calculate rank correlation from the following data: 3

Student No.	1	2	3	4	5	6	7	8	9	10
Rank in Maths	1	3	7	5	4	6	2	10	9	8
Rank in statistics	3	1	4	5	6	9	7	8	10	2

12. Explain the central problem 'what to produce'.   3

13. Explain any two factors which may affect price elasticity of demand of a commodity.   3

14. Distinguish between explicit cost and implicit cost of produciton. Give one example of each.
                                                                                             3

15. Market for a good is in equilibrium. Explain the effect of increase in demand for the good
    on price and quantity demanded and supplied.   3

16. Calculate net value added at factor cost from the following data: 3

		₹ in thousands
(i)	Sales	3000
(ii)	Depreciation	50
(iii)	Intermediate consumption expenditure	1000
(iv)	Indirect taxes	25
(v)	Subsidies	5
(vi)	Increase in stock	10

17. Distinguish between final goods and intermediate goods. Give one example of each. 3

18. In an economy, the populaiton spends ₹ 500 crores on absolute necessities needed to sustain themselves. The current income is ₹ 2500 crores and MPC is 0.5. What is the level of consumption. 3

19. What is meant by revenue receipts and capital receipts in a government budget. Give one example of each. 3

20. Calculate fiscal deficit from the data given below: 3

		₹ in crores
(i)	Capital receipts net of borrowings	40
(ii)	Revenue receipts	20
(iii)	Capital expenditure	50
(iv)	Revenue expenditure	30

21. State any four important issues which should be kept in mind for the construction of index number. 4

22. Give any four difference between microeconomics and macro economics. 4

23. Explain the effect of increase in income of the consumer on the demand for a commodity. 4

24. A firm supplies 120 units of a good when its price is ₹ 10 per unit. When price rises to ₹ 12 per unit, it supplies 144 units of this good. Calculate the co-efficient of price elasticity of supply of this good. 4

25. State any four important features of a perfectly competitive market. 4

26. Equilibrium level of national income is established where C+1 curve intersects 45° line. Explain with the help of a suitable diagram. 4

27. Using step deviation method, calculate arithmetic mean from the data given below 6

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of students	5	10	12	24	23	14	8	4

28. What is Lorenz curve? State the steps involved in drawing Lorenz curve. 6

29. A consumer purchased two goods X and Y. Explain the condiitons of his equilibrium using indifference curve approach 6

30. Explain the law of variable proportions in the context of total product and marginal product.

    6

31. Calculate; (a) National income and (b) Gross national disposable income, from the data given below:

		₹ in crores
(i)	Private final consumption expenditure	5000
(ii)	Depreciation	50
(iii)	Net exports	40
(iv)	Net factor income from abroad	10
(v)	Government final consumption expenditure	6000
(vi)	Gross investment	3000
(vii)	Net indirect taxes	20
(viii)	Net current transfers from rest of the world	30

6

32. What is meant by barter system of exchange. Expalin any two demerits of this system of exchange.

    6