Economics for Engineers

MODULE 1

Introduction to the subject: Micro and Macro Economics, Relationship between Science, Engineering, Technology and Economic Development. Production Possibility Curve, Nature of Economic Laws.

MODULE 2

Time Value of Money: concepts and application. Capital budgeting; Traditional and modern methods, Payback period method, IRR, ARR, NPV, PI (with the help of case studies)

MODULE 3

Meaning of Demand. Law of Demand, Elasticity of Demand; meaning, factors effecting it and its practical application and importance. Demand forecasting (a brief explanation)

MODULE 4

Meaning of Production and factors of production, Law of variable proportions and returns to scale. Internal and external economies and diseconomies of scale. Concepts of cost of production, different types of costs; accounting cost, sunk cost, marginal cost, Opportunity cost. Break even analysis, Make or Buy decision (case study). Relevance of Depreciation towards industry.

MODULE 5

Meaning of market, types of market, perfect competition, Monopoly, Monopolistic, Oligopoly. (main features). Supply and law of supply, Role of demand and supply in price determination.

MODULE 6

Indian Economy, nature and characteristics. Basic concepts; fiscal and monetary policy, LPG, Inflation, Sensex, GATT, WTO and IMF. Difference between Central bank and Commercial banks

TEXT/ REFERENCES BOOKS

1. **Jain T.R., "*Economics for Engineers*", VK Publication**
2. **Chopra P. N., "*Principle of Economics*", Kalyani Publishers**
3. **Dewett K. K., "*Modern economic theory*", S. Chand**
4. **H. L. Ahuja., "*Modern economic theory*", S. Chand**
5. **Dutt Rudar & Sundhram K. P. M., "*Indian Economy*"**
6. **Mishra S. K., "*Modern Micro Economics*", Pragati Publications**
7. **Pandey I.M., "*Financial Management*"; Vikas Publishing House**
8. **Gupta Shashi K., "*Management Accounting*", Kalyani Publication**

What is Economics in General?

- **The word Economics is derived from the Greek words "OKIOS NEMEIN" meaning household management .**
- **Scarcity is the condition in which our wants are greater than our limited resources.**
- **Since we are unable to have everything we desire, we must make choices on how we will use our resources. It all about taking conscious decisions, by analyzing various options, cost and benefit analysis**
- **In economics we will study the choices of individuals, firms, and governments.**
- **Economics is not the study of money!!!**

Economics is the study of _choices_.

Examples:

You must choose between buying jeans or buying shoes.
Businesses must choose how many people to hire
Governments must choose how much to spend on welfare.

Scarcity and Social Choice

- The problem for society is a scarcity of resources
  1. **Scarcity of land (natural resources)**
     - Physical space on which production occurs, and the natural resources that come with it like oil, coal, iron etc
  2. **Scarcity of Labor (manual or mental)**
     - Time human beings spend producing goods and services
  3. **Scarcity of Capital (man made resources)**
     - Something produced that is long-lasting, and used to make other things that we value like factories, offices, machinery, new technology, schools, hospitals, roads
  4. **Scarcity of Entrepreneurship (intellectual resources)**
     - Ability and willingness to combine the other resources into a productive enterprise, new ways of produce new products. It includes decision making and risk taking of the entrepreneurs. Some countries have shortage of talented entrepreneurs
- As a society our resources—land, labor, and capital—are insufficient to produce all the goods and services we might desire
  - In other words, society faces a scarcity of resources

Scarcity and Economics

- The scarcity of resources—and the choices it forces us to make—is the source of all of the problems studied in economics
  - Households allocate limited income among goods and services
  - Business firms choices of what to produce and how much are limited by costs of production
  - Government agencies work with limited budgets and must carefully choose which goals to pursue
- Economists study these decisions to
  - Explain how our economic system works
  - Forecast the future of our economy
  - Suggest ways to make that future even better

How as a data science professional scarcity means to you?

Do you know??

- 2500 years ago, Chanakya (283 BC) also known as Kautilya is considered as the pioneer in the field of Economics. His book 'Arthashastra' is a comprehensive manual in Sanskrit which includes politics, law, civil and criminal court systems, ethics economics, marketing and trading etc.
- According to Kautilya, *"The intention of a human being is 'arth' (wealth); the piece of land which has human settlement is 'arth' (wealth) and thus the science expanding the purpose and utility of wealth creation on earth is called Economics."*

Economics Definitions

Adam Smith [Wealth definition]

(Father of Economics)

"Economics is the study of the nature and causes of wealth of nations".

Alfred Marshall [Welfare definition]

"Economics is the study of mankind in the ordinary business of life implies that in everyday life people usually seek material well-being".

Lionel Robbins [Choice or Scarcity definition]

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

Paul Samuelson [Economics of Growth and Development]

"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 amongst various people and groups of society".

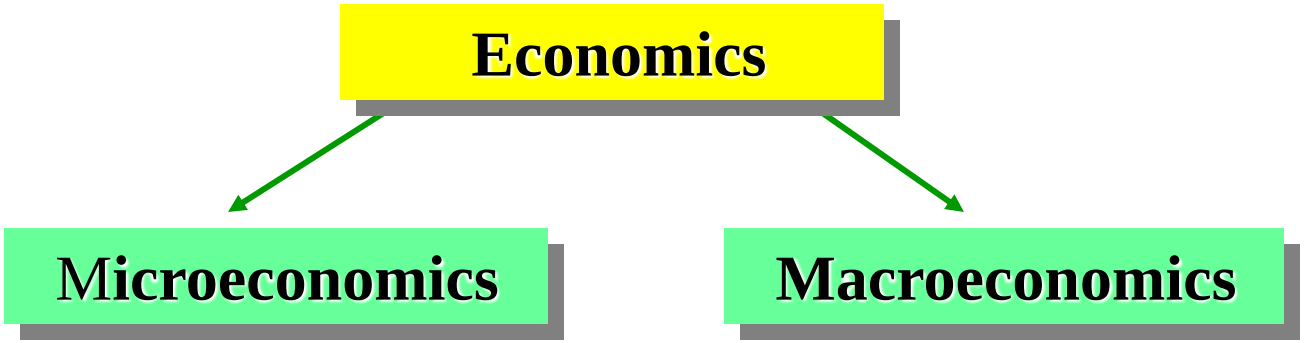
Modern Definition (2011) - Prof. A. C. Dhas

According to Prof. A.C. Dhas, "Economics is the study of choice making by individuals, institutions, societies, nations and globe under conditions of scarcity and surplus toward maximizing benefits satisfying their unlimited needs at present and future".

In short, the subject Economics is defined as the "Study of choices by all in maximizing production and consumption benefits with the given resources of scarce and surplus, for present and future needs."

Economics is a discipline which studies how scarce economic resources are allocated and used to maximize production for a society. It is a *social science* which deals with *economic behavior* of individuals and organizations engaged in the production, distribution and consumption of goods and services.

The study of economics is subdivided into two general fields:



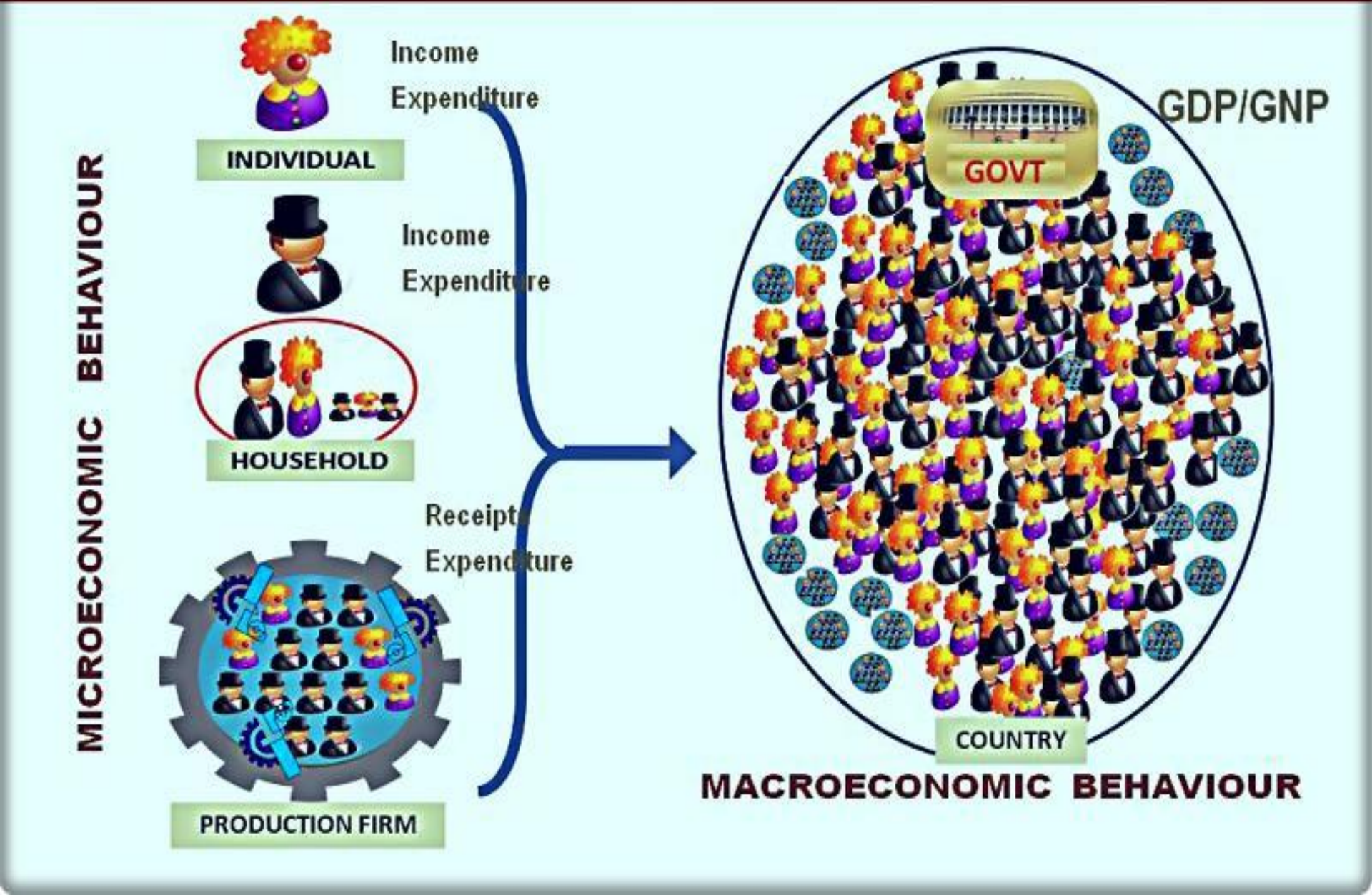
Microeconomics

- Micro
  - Micro comes from Greek word *mikros*, meaning “small”
- Microeconomics
  - Study of behavior of individual households, firms, and governments
    - Choices they make
    - Interaction in specific markets
- Focuses on individual parts of an economy, rather than the whole
- Microeconomics is Study of small economic units in the economy, including individual agents and markets, their interactions, and the outcomes of interactions. Individual agents may include, for example, individuals, households, firms, buyers, and sellers.

Macroeconomics

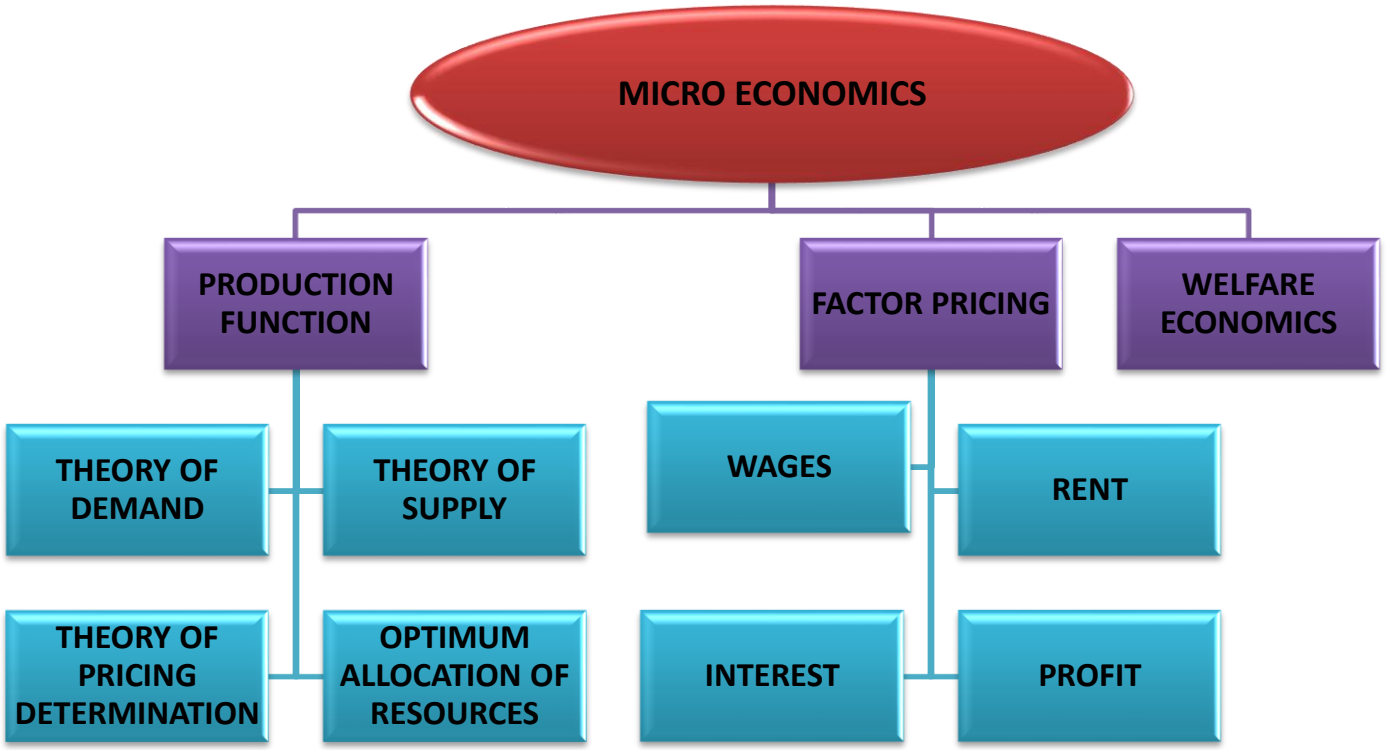
- Macro
  - Macro comes from Greek word, *makros*, meaning "large"
- Macroeconomics
  - Study of the economy as a whole
- Focuses on big picture and ignores fine details
- Macroeconomics is study of the large economy as a whole where production, consumption, saving, and investment interact, and factors affecting it. (National Economic Growth like GDP, Government Spending, Inflation, Unemployment, international trade, trade deficit, monetary and fiscal policy etc.)

MICROECONOMICS Vs MACROECONOMICS



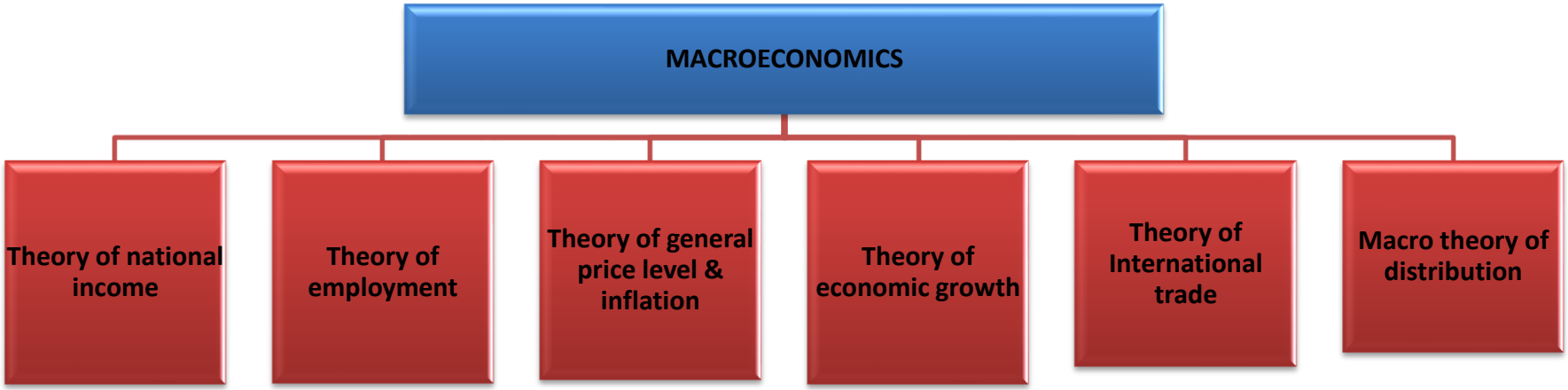
The Scope of Economics

- ***Microeconomics*** is the branch of economics that examines the behavior of individual decision-making units—that is, business firms and households.



The Scope of Economics

- ***Macroeconomics*** is the branch of economics that examines the behavior of ***economic aggregates***— income, output, employment, and so on—on a national scale.



The Scope of Economics

Examples of microeconomic and macroeconomic concerns				
	Production	**Prices**	**Income**	**Employment**
Microeconomics	Production/Output in Individual Industries and Businesses How much steel How many offices How many cars	Price of Individual Goods and Services Price of medical care Price of gasoline Food prices Apartment rents	Distribution of Income and Wealth Wages in the auto industry Minimum wages Executive salaries Poverty	Employment by Individual Businesses & Industries Jobs in the steel industry Number of employees in a firm
Macroeconomics	National Production/Output Total Industrial Output Gross Domestic Product Growth of Output	Aggregate Price Level Consumer prices Producer Prices Rate of Inflation	National Income Total wages and salaries Total corporate profits	Employment and Unemployment in the Economy Total number of jobs Unemployment rate

Using Microeconomics in Macroeconomics

Macroeconomics is based on microeconomics (has microeconomic foundations), because ***macroeconomic events*** are the ***result of the decisions of millions of individual agents***, maximizing their own welfare and arise from the interaction of many people.

At the same time all the ***decisions of individual agents*** are made taking into account the ***macroeconomic situation***.

Microeconomics ⇄ **Macroeconomics**

Micro Economics	Macro Economics
1. It studies the individual unit.	1. It studies the whole economy or large groups.
2. Laws related to Marginal analysis are included in its scope.	2. Problems related to whole economy like employment, public finance, national income etc. are included in its scope
3. Micro Economics provides the information relating to the individual prices, individual consumption and production.	3. Macroeconomics provides the information relating to National Income, total output, total consumption and general price level
4. Micro economics analysis is simple	4. Macroeconomics is complex due to the study of large groups.
5. Micro economics particularly focus on price analysis.	5. Macro Economics particularly focus on income analysis
6. Micro economics studies individual problems and it is less important for comparative study	6. Macroeconomics studies the problems relating to the economy and its importance is growing.

Science, Engineering and Technology & Economic Development

- **Science** is a systematic body of knowledge based on facts, having cause and effect relationship, can be experimented to produce generalized true principles.
- **Engineering** can be defined as the application of scientific and mathematical principles used for practical purpose like design, manufacture, and operation of efficient and economical structures, machines, processes, and systems.
- **Technology** can be broadly defined as the entities, both material and immaterial, created by the application of mental and physical effort in order to achieve some value.
- **Economic development** is the growth of the standard of living of a nations people from a *low-income* (poor) economy to a *high-income* (rich) economy or low-income national economies are transformed into modern industrial economies. When the local *quality of life* is improved, there is more economic development.

Relationship b/w Economics and Science

Science is a systematic body of knowledge based on facts, having cause and effect relationship, can be experimented to produce generalized true principles.

Economics is Science:

- ✓ In economics there is a systematized collection, classification and analysis of economic facts.
- ✓ In the case of economic experiment, there is no need of laboratory and we treat the whole social and national system as laboratory.
- ✓ The laws of economics have the universal validity like the laws of science.
- ✓ Everything is measurable and Systemic in science as of economics like collection of data

Relationship b/w Economics and Technology

- It has wide scope in Computer Science, IT, Mechanical ,Manufacturing, construction, mining and other engineering industries. Examples of economic application are as follows:
- Better decision making and planning on the part of engineers.
- Efficient use of resources results in better output and economic development.
- Cost of production can be reduced.
- Alternative courses of action using economic principles may result in reduction of prices of goods and services.
- More capital will be made available for investment and growth.
- Improves the standard of living with the result of better products, more wages, and salaries, more output etc. from the firm applying engineering economics.

Relationship between Science, Engineering, Technology and Economic development

Example of a Television:

Economics.

Lets go back in time to 1950's when radios were all the rage. Radio was fun and engaging. They were popular. Advertisers poured money and it was a good business. Then, however, people wanted more. Imagine watching that sports game rather than hearing the commentary. This idea seemed big.

Science

So now people wanted to see the match in addition to hearing about it. Enter **science**. The tech behind television is based on solid principles of physics. How light behaves, how photons behave when scattered across a medium and so on. This is where your plain-jane research scientists worked together to come up innovative techniques to harness the power of physics into something which can be used by engineers for building the fabled TV.

Engineering

So now the science guys have established theories and come out with some cool new technology. The engineers now work on that to bring it to life. This involves applying the theory of light and related knowledge to build something practical. This involves building the CRT tube, adding speakers and so on.

Technology

So now the initial TV is built and is working. The next task is agreeing on a broadcast standard, adding useful features like maybe picture adjustment, way of tuning channels and so on. This is where the technology aspect comes in.

Economics

Once the TV is built, it needs to be manufactured in large numbers, marketed and actually make it available to end users for purchase.

This is where economics and market plays a role. Manufacturers started flooding the markets with TV's, advertising about it and so on.

Eventually it became mainstream.

This flow shows how all the above terms are linked in real life.

Relationship b/w Economics and Engineering

- Engineering involves application of scientific knowledge for the betterment of quality of life
- Purpose of an engineer is to apply his knowledge to produce products and services
- Because of development of engineering, it has provide the means of both cultural and economic development
- Engineering help to smooth the decision making, to fasten the operations
- *Basic Tools of Analysis*- Economics play an important role in engineering by providing it basic tools like demand, cost, revenue, firm, industry, market, forecasting, pricing etc.
- *Decision making*- provides the practicing engineers with the techniques for profitable decision making , a choice of among two or more alternatives
- Engineering Design Process- Some aspects of engineering activity that directly call for economic & financial analysis . This may be concerned with the selection of alternatives & technically feasible means of providing some production service. This may be related with the costing of some activities

Economic Development

Economic Development = Economic Growth + Change

Economic Growth – rate of growth in real national income over a long period of time

Economic development implies inclusive growth i.e. Growth with development in terms of changes in the way the organisation / nation functions. Projects undertaken with the objective of reducing poverty, increasing employment, development of infrastructure etc.

Engineering & Economic Development

i. Technical Up gradation / Innovation / Inventions

ii. Infrastructure Development

Science & Economic Development

i. Utilisation of Natural Resources – science provides key for unlocking the natural wealth

Economic Development

Science & Economic Development

ii. Increased Efficiency – innovating / inventing techniques for improving efficiency leading to increase in productivity, reduction in cost or increase output by marginally changing the inputs.

iii. Factor Substitution – Law of equi-marginal utility can help engineers in a way that he substitutes one of the inputs to minimise cost

iv. Overcoming Scarcity – example Green Revolution or White Revolution

v. Science and technology for National Self Reliance

Significance of Economics

1. *Importance for individuals*-

- ✓ Individuals often face the problems of scarcity and choice making
- ✓ An individual can realize the market forces and take decision about the time and rates at which to buy desired products.
- ✓ Example- marginal utility, indifference curve etc help the individual to maximize his satisfaction with the use of minimum resources

2. Importance of Business Firms –

- ✓ Economic laws and theories establish cause and effect relationship which are true under certain assumption
- ✓ The laws of production are particular helpful to business- an optimum factor mix
- ✓ Economics help in forecasting demand such as size of the market, the degree of competition, elasticity of demand etc.
- ✓ For making business required suitable choice of location, availability of raw material, transport facilities, power and labour etc.

Significance of Economics

- ✓ The price situation, general price level, foreign exchange rate etc.
- ✓ Economics helps a business manager to analyze the external environment
- ✓ Govt. influences business through fiscal, monetary and industrial policies
- ✓ Businessman must be aware what is happening in other countries.

Importance to the Nation

An economy exists because of two basic facts

a) Human wants for goods and services are unlimited

b) Productive resources with which to produce goods and services are scarce

Therefore an economy has to decide how to use its scarce resources to obtain the maximum possible satisfaction.

The subject matter of economics has been divided into two parts- micro and macro

Why Study Economics

- To understand the world better
  - You'll begin to understand the cause of many of the things that affect your life
- To gain self-confidence
  - You'll lose that feeling that mysterious, inexplicable forces are shaping your life for you
- To achieve social change
  - You'll gain tools to understand origins of social problems and design more effective solutions

Why Study Economics

- Deciding the price of a product and the quantity of the commodity to be produced.
- Deciding whether to manufacture a product or to buy from another manufacturer.
- Choosing the production technique to be employed in the production of a given product.
- Deciding on the level of inventory a firm will maintain of a product or raw material.
- Deciding on the advertising media and the intensity of the advertising campaign
- Making employment and training decisions.
- Making decisions regarding further business investment.

KEY CONCEPTS OF ECONOMICS

1. Consumer : An individual who buys various goods and services to satisfy his or her wants.

2. Consumption: An act of a consumer which is concerned with the use of various goods and services to satisfy wants.

3. Producer: An individual who is involved with the activity of producing goods as a farmer or a manufacturer.

4. Production: An act of a producer to produce various goods and services, which is concerned with creating utility to satisfy consumer wants.

5. Utility : The capacity of a commodity to satisfy human wants.

KEY CONCEPTS OF ECONOMICS

6. Exchange : An act of selling and buying goods and services.

7. Factors of production : The term used for the resources of society which are used in the process of Production like Land, Labour, Capital and Entrepreneurship.

8. Factor Incomes : Incomes accruing to the factors of production in terms of Rent, Wage, Interest and Profit.

9. Investment: The purchase of goods that are not consumed today but are used in the future to create wealth.

10. Savings : Excess of income over the Expenditure.

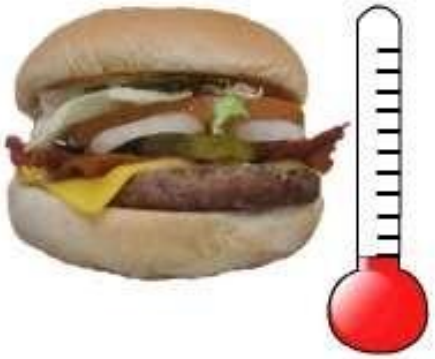
Utility

Burger 1
Eating the first burger gives the consumer a lot of ***satisfaction***

(utility)

Burger 2
Eating a second burger will not give as much ***extra satisfaction*** as the first did
(marginal utility)

Burger 3
Eating a third burger will give even ***less extra satisfaction*** then eating the second one
(diminishing marginal utility)



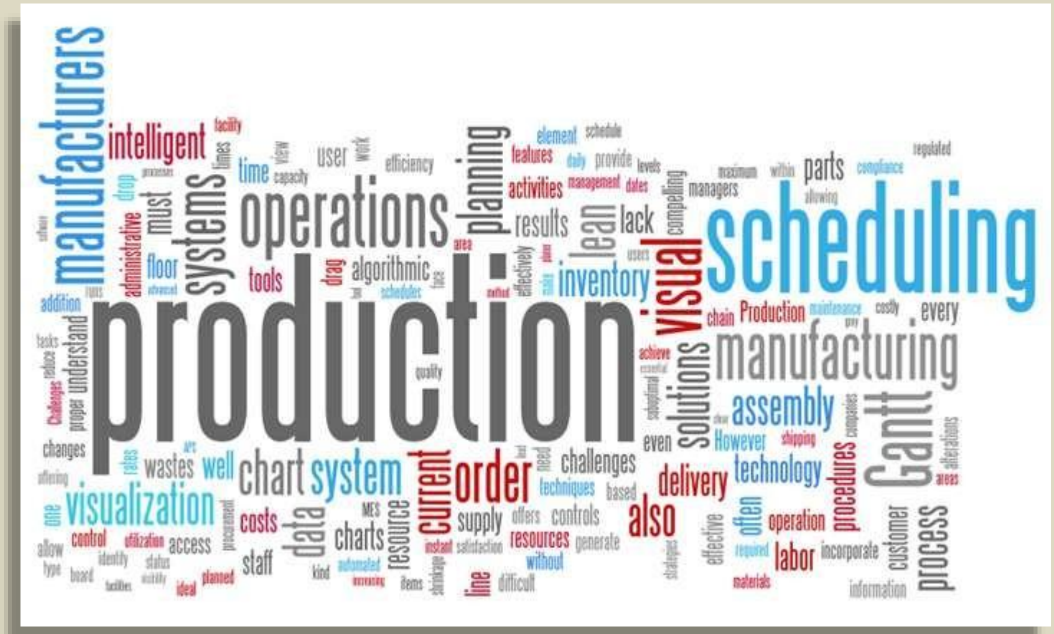
Satisfaction thermometer

Production

Production means "creation of utility".

- **It also refers to creation of goods (or performance of services) for the purpose of selling them in the market.**
- **There was a time when production meant the fabrication of material goods only.**
- **A tailor's activity was considered to be production but the activity of the trader who sold clothes to the purchasers was not considered as production.**
- At present, both material goods and services are considered as production.
- Production must be for the purpose of selling the produced goods (or, services) in the market.

Production

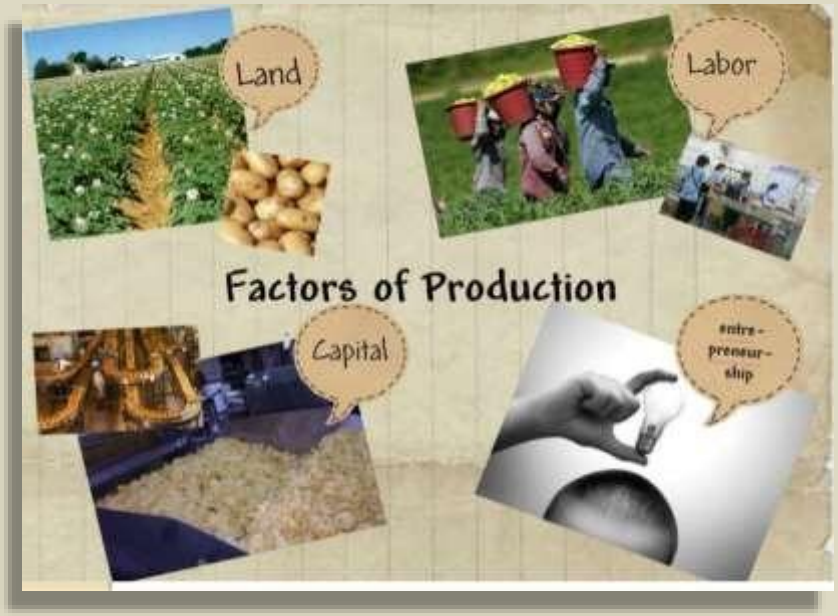


production
scheduling
operations
manufacturing
manufacturers
intelligent
systems
planning
inventory
visual
assembly
Gantt
chart
system
order
current
visualization
delivery
technology
also
procedures
process
data
charts
challenges
solutions
lean
results
lack
tools
algorithmic
floor
must
parts
time
user
efficiency
features
activities
Production
every
costs
supply
controls
resources
operation
labor
customer
wastes
well
staff
access
changes
understand

Factors of Production

- **The goods and services with the help of which the process of production is carried out, are called factors of production.**
- Economists talk about four main factors of production : **land, labour, capital and entrepreneurship (or organization).**
- **They are also called as the inputs of production. On the other hand, the goods produced with the help of these inputs, are called as the output.**

Factors of Production



4 Factors of Production (C-E-L-L)

- **LAND:** gifts of nature, not created by human effort
- **CAPITAL:** tools, equipment and factories used to produce goods and services.
- **LABOR:** people with all their efforts, abilities and skills
- **ENTREPRENEURS:** people who take risks in search of profit; they start new businesses or bring new products to market.

Production Possibility Curve (PPC)

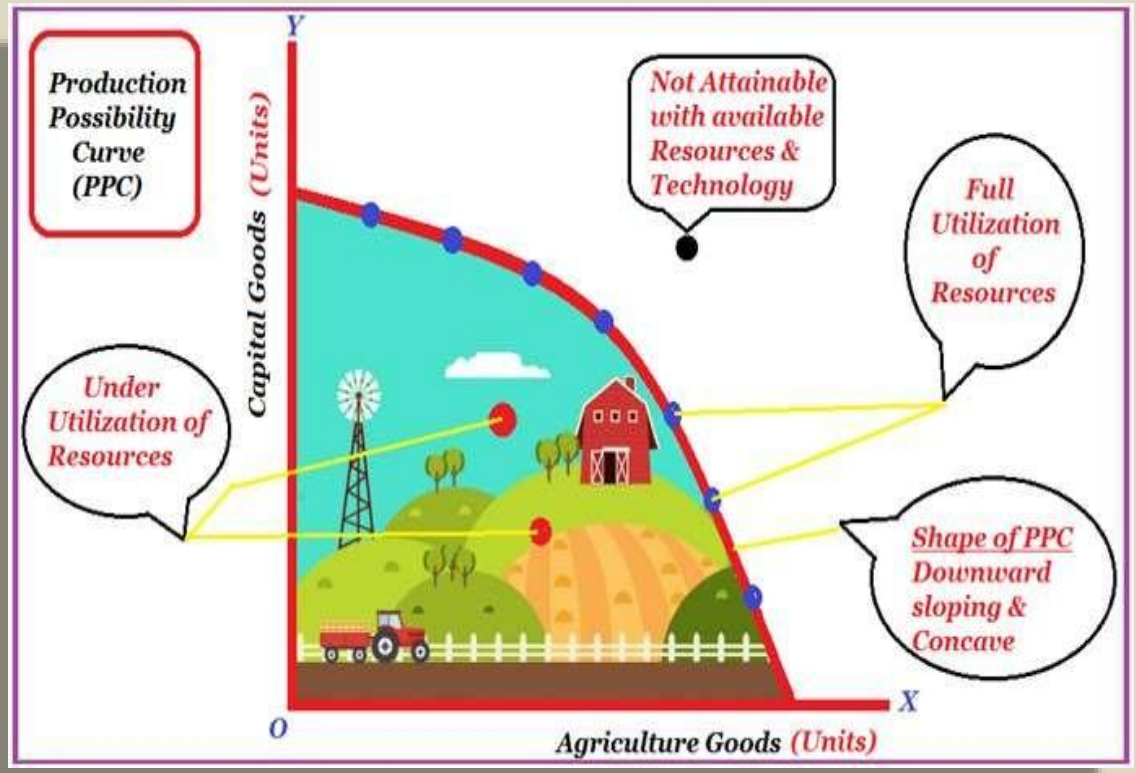
Production Possibilities and Opportunity Costs

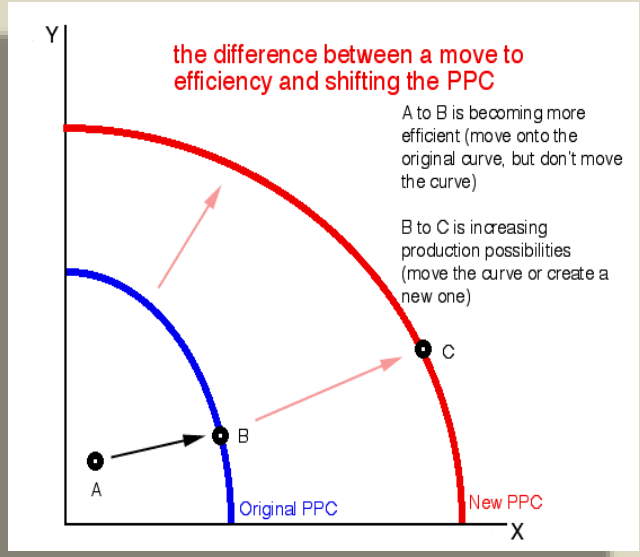
- ***The production possibility curve can be defined as a curve which shows the maximum combination of output that the economy can produce using all the available resources.***

Resources

- **Production is "the process of using the services of labor and other resources to make goods and services available." Resources are the inputs required for production, and consist of land, labor, capital and entrepreneurship.**

Production Possibility Curve (PPC)



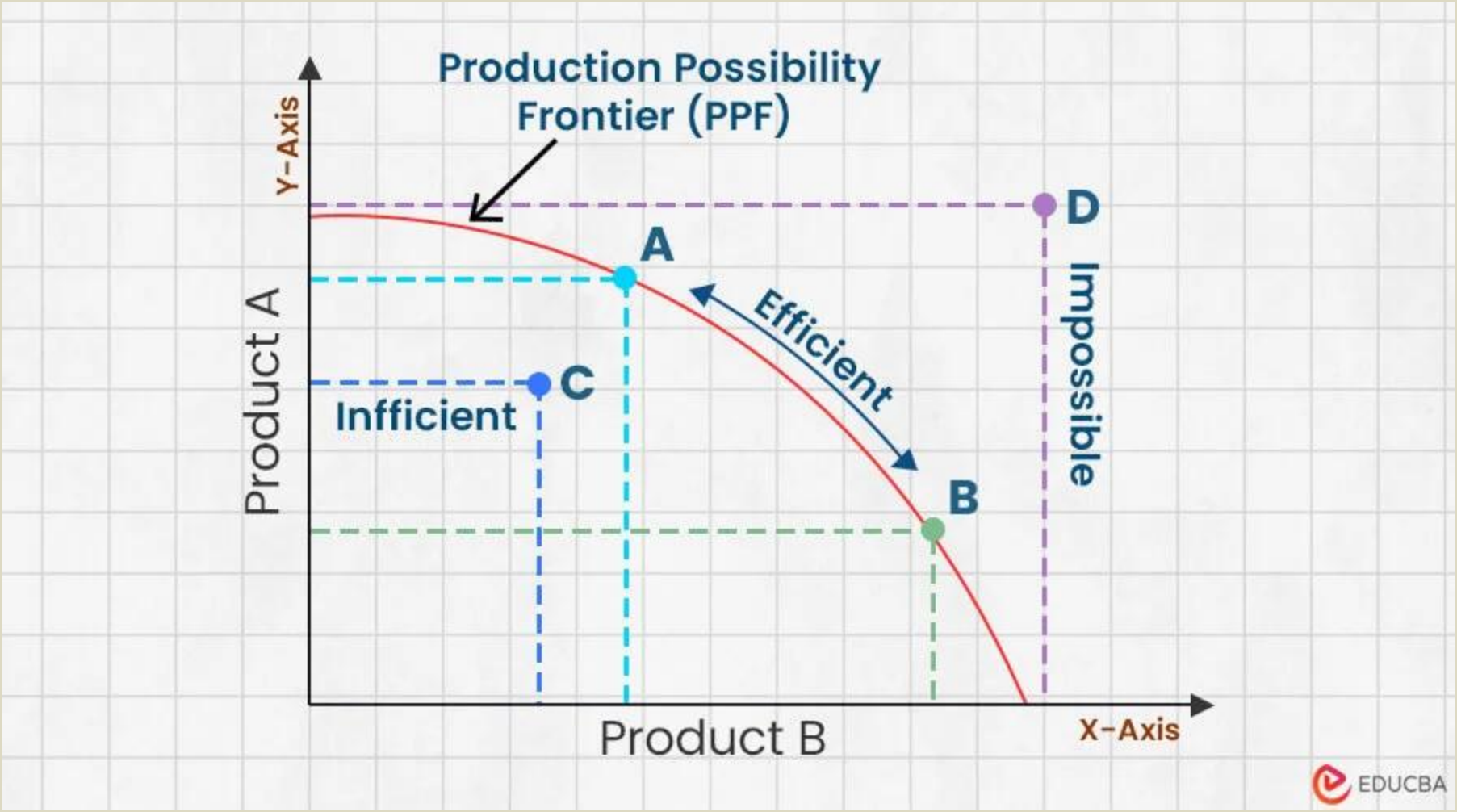


Production Possibility Curve (PPC)

- **The production possibility curve helps us understand the problem of scarcity better, by showing what can be produced with given resources and technology.** Technology is the knowledge of how to produce goods and services.

Production Possibility Curve (PPC)

- In economics, a **production–possibility curve (PPC), is also called a production–possibility frontier (PPF),**
- **production-possibility boundary or product transformation curve, is a graph that compares the production** rates of two commodities that use the same fixed total of the factors of production. Graphically bounding the production set, the PPF curve shows the maximum specified production level of one commodity that results given the production level of the other.
- By doing so, it defines productive efficiency in the context of that production set.


Production Possibility Frontier (PPF)
Y-Axis
Product A
D
Impossible
A
Efficient
C
Infficient
B
Product B
X-Axis
EDUCBA

Production Possibility Curve (PPC)

- Let us consider the shape and use of the production possibility curve. In our discussion we make the following assumptions:
- **(1) Only two goods, X and Y, are being produced.**
- **(2) Only one factor of production is used in the production.** That factor of production is labour. Supply of labour in the economy is fixed and total amount of labour is fully employed.
- **(3) The two goods can be produced in various ratios**. This means that the country can produce more of X and less of Y or less X and more of Y.
- **(4) There is no change in production process or production technology.**

Production Possibility Curve (PPC)

- With the help of these assumptions we can explain how the production possibility curve can be obtained.
- **Suppose the country can produce different alternative combinations of X and Y with its given amount of labour.**

Those combinations are shown with the help of the following hypothetical schedule

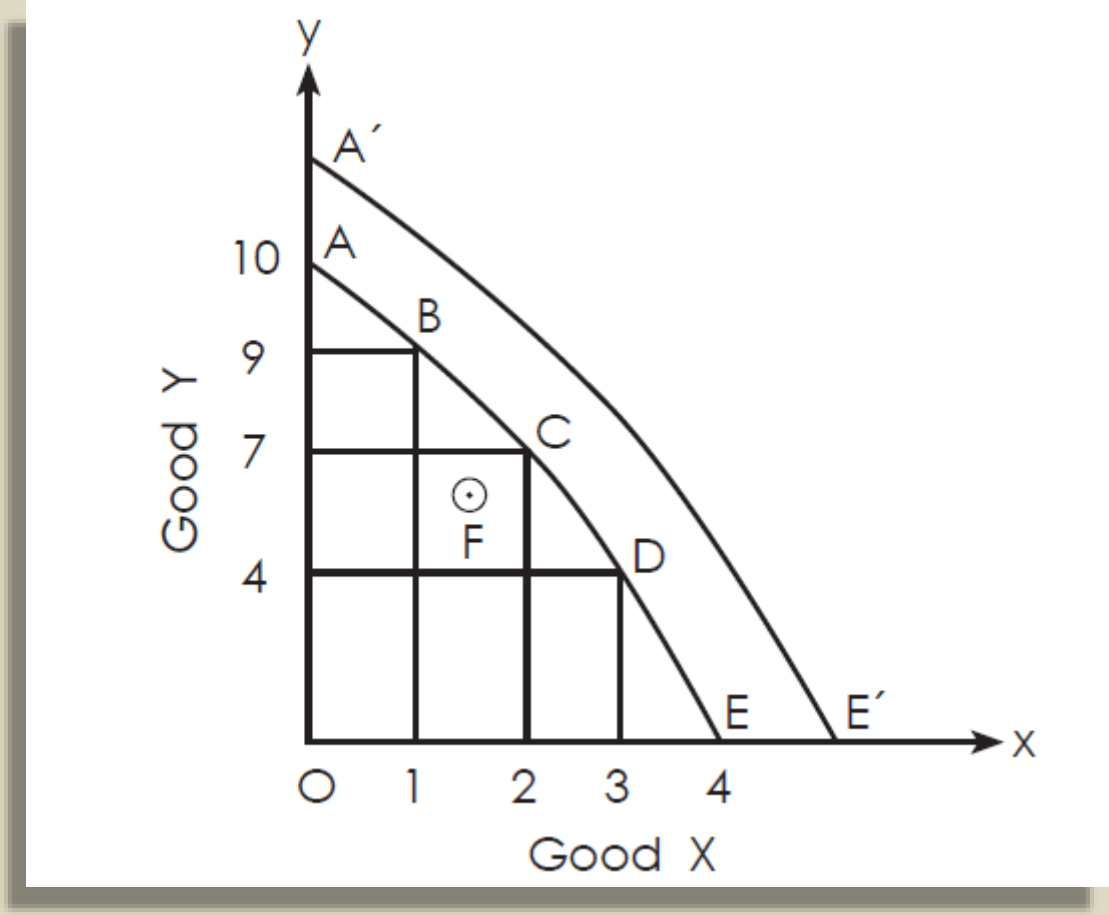
Production Possibility Schedule

Good X	Good Y
0	10
1	9
2	7
3	4
4	0

Production Possibility Curve (PPC)

- **From this schedule we see that if the country produces only Y and no amount of good X, then it can produce a maximum of 10 units of Y.** So, we get a combination (0, 10) on the production possibility curve.
- **Again, if the country does not produce good Y and devote its entire resources in the production of X, then it can produce a maximum of 4 units of X.** Hence, point (4, 0) will be a combination of two goods on the production possibility curve.
- **In this way, employing the entire resource (labour), the country can produce 1 unit of good X and 9 units of good Y, or 2 units of good X and 7 units of good Y, etc.**

Production Possibility Curve (PPC)



Production Possibility Curve (PPC)

- In figure, plot the amount of good X (say, x) on the horizontal axis and the amount of good Y (say, y) on the vertical axis.
- In this figure, AE is the production possibility curve.

Production Possibility Curve (PPC)

- **At A on this curve**, x = 0 and y = 10 i.e., point A expresses the combination (0, 10). Similarly, point B represents the combination (1, 9), point C represents the combination (2, 7), point D represents the combination (3, 4) and point E expresses the combination (4, 0).
- **With the given amount of labour, the country can produce any product combination on the production possibility curve AE.** This curve is downward sloping.
- **It implies that, given the amount of labour, if the country increases the production of one good, it must reduce the production of the other.**

Production Possibility Curve (PPC)

- **The country can produce any combination below AE but it cannot produce any combination lying to the right of AE.**
- **Let F be a point to the left of AE. At this point, some amount of labour will remain unutilised.** By full employment of labour, the country can move from F to any point on AE where the production of at least one commodity will increase.

Production Possibility Curve (PPC)

- **Again, if it is found that there is full employment of labour but output is obtained as represented by F, then it should be understood that production has not been done efficiently.** In that case, it is possible to increase the production of both goods by efficient utilisation of labour.
- **If the given amount of labour is fully utilised, the country can produce any combination of X and Y on AE.**
- **Hence, to determine the production levels of two goods means to determine the point on the production possibility curve at which the country will stay.**

Uses of the PPC

The uses of the PPC are discussed briefly below:

- **Knowledge of economic efficiency: The PPC shows whether an economy is utilizing its resources fully**. If the resources are not used fully, it will be below the curve.
- **Choice of the techniques of production:** The critical factors determining the technology of production are labor and capital, i.e. whether production is to be labor- intensive or capital-intensive.

- **Distribution of the national income: The production possibility curve tells us about the distribution of the national income**. For example, if a country produces more cars (luxury items) than food and clothing, **then there is likely to be an inequality in the distribution of wealth**.

Uses of the PPC

- **Opportunity Cost Analysis:** Moving from one point to another on the curve shows the trade-off between two goods. The **opportunity cost** is the amount of one good that must be sacrificed to produce more of the other.
- **Economic Growth Measurement:** An outward shift of the PPC represents economic growth due to improved technology or increased resources. A contraction shifts the curve inward, indicating a decline in economic capacity.
- **Understanding Unemployment and Inefficiency:** Points **inside the PPC** indicate underutilization of resources, such as unemployment or inefficient production. Points **on the PPC** indicate full and efficient use of resources.
- **Understanding Economic Problems:** PPC helps analyze fundamental economic problems such as **scarcity, choice, and efficiency**, demonstrating the limits of production capabilities.

Economics Laws

- Economic laws are the statements of uniformities which govern human behavior concerning the utilization of limited resources for the attainments of unlimited ends. Economic laws are scientific laws because they establish relationship between economic cause and their effects.
- E.g. Law of demand, it states that when the price of a commodity rises its demand is likely to contract.
- Cause-rise in price and effect contraction of demand
- Unlike the laws of other sciences, law of economics does not describe a particular phenomenon, rather they describe general features of all similar phenomenon. That is why these laws are also known as generalization.

Nature or feature of Economic Laws

Economic Law is a statement about the cause and effect relationship

i. *Economic laws are human laws*
ii. *Economic laws are statement of tendencies / trends – It implies that laws of economics are not exact like the physical law of Gravitation/ Newton's Law of Motion.*
iii. *Economic laws are Hypothetical*
iv. *Generalization*
v. *Economic laws are relative*
vi. *Economic laws are qualitative in nature*

Nature or feature of Economic Laws

vii. *Economic laws are uncertain*

viii. *Economic laws are less universal – hold good in* capitalist v/s socialist country attitudes

ix. *Economic laws have relatively poor predictability- Economics laws can not be predicted accurately to produce the desired results within a stipulated period.*

x. *Economic laws can not be subjected to controlled experiment* – deals with human behaviour and not with physical matter. Not possible in Laboratory.

The Method of Economics

- ***Positive economics*** studies economic behavior without making judgments. It describes what exists and how it works.
- ***Normative economics,*** also called policy economics, analyzes outcomes of economic behavior, evaluates them as good or bad, and may prescribe courses of action.

Nature of Managerial Economics

Positive and Normative Economics

Positive Economics:

The scientific study of "what is" among economic relationships. It establishes a relationship between cause and effect and analyses problems on the basis of facts.

- ✓ Goods are ***scarce*** because desire for them far outstrips their availability from nature.

- Positive economic statements are factual and ***can*** be proved either true or false.
- *Example*:
  - ❑ The inflation rate rises when the money supply is increased.
  - ❑ Demand increases when price falls.

Nature of Managerial Economics

***Normative Economics*:**

Judgments about *"what ought to be"* in economic matters. It looks at the desirability of certain aspects of the economy.

Normative statements reflect subjective values. They ***cannot*** be proved true or false.

Example:

The inflation rate should be lower.

Vital issues in the areas of economic planning, economic policies, anti-unemployment and poverty alleviation programmes can not be debated without considering the normative implications.

<u>It is therefore both a Positive and a Normative Science</u>