Microeconomics

1 AN INTRODUCTION TO MICROECONOMICS

1.1. Concept of market economy

An **economic system** is a social organism through which people make their earnings

The market economy is mainly characterized as follows

- Both individual producers or consumers pursue their own self-interest in transactions of goods and service what seems best for themselves and their families
- Other things being equal sellers seek high prices while buyers seek low prices. It implies that people respond to incentives
- Government promotes market mechanism. Thus, prices of the products are determined in open market in which suppliers compete to sell to potential buyers
- Peoples earn their incomes by selling their services to those who wish to use them-their labour services-or by selling things they have produced, or by selling the services of the property that they own
- Most of the economics activities are governed by a legal framework largely created, administered and enforced by the state. But some economics activities are induced by government actions like infrastructure development and incentives like subsidies

1.2. Microeconomics

Microeconomics deals with the choice and decision making behavior of households, firms and industries and the relationship between prices and quantities of individual goods and services

K. E. Boulding-*"microeconomics is the study of particular firms, particular household, individual price, wages, income, industry and particular commodity"*

Lerner-*"microeconomics consist of looking at the economic through a microscope as it were to see how the millions of cell in the body economic, the individuals or households as consumers and the individuals or firms as producers play their part in the working of the whole economic organism"*

Scope of microeconomics

- Theory of demand
- Theory of production
- Theory of product pricing
- Theory of factor pricing
- Theory of economic welfare

1.3. Type of microeconomics

❖ Static analysis

➢ Micro-static

➢ Comparative micro-static

Comparative micro-static provides the answer of following question

- What shows initial equilibrium about microeconomic variables
- What shows new equilibrium about microeconomic variables
- What is the comparatives difference in microeconomic variables between two equilibrium conditions

Comparative micro-static does not provide the answer of following question

- What is the cause for breaking initial equilibrium
- What is the cause for establishing new equilibrium
- What types of other changes occur between two equilibriums

❖ Dynamic analysis[micro dynamic]

Dynamic analysis or micro-dynamics provides the answer of following question

- What is the cause for breaking initial equilibrium
- What is the cause for establishing new equilibrium
- What types of other changes occur between two equilibriums

But dynamic analysis or micro-dynamics does not provide the answer of following question

- What shows initial equilibrium about microeconomic variables
- What shows new equilibrium about microeconomic variables
- What is the comparatives difference in microeconomic variables between two equilibrium conditions

Dynamic analysis or micro-dynamics draw following conclusions

- The main cause for breaking initial equilibrium is increase in market demand due to change in non-price factors
- The main cause for establishing new equilibrium is price mechanism i.e. interaction between market demand and supply
- Study of all changes in microeconomic variable between two equilibrium, E_1 and E_2

1.4. Uses and importance of microeconomics

- To understand the operation of an economic operation
- To provide tools for economic policies

- To examine the conditions of economic welfare
- Efficient utilization of resources
- Useful in international trade
- Useful in business decision making[microeconomis and decision making in business operation]

➢ Optimal resources allocation
➢ Basis for prediction
➢ Price determination

1.5. Fundamental principles of economics

- People face trade-offs
- The cost of something is what you give up to get it
- Rational people things at the margin
- People respond to incentives
- Trade between the countries can make each country better off
- Markets are usually a good way to organize economic activities
- Government sometimes improve market outcomes
- A country's standard of living depends on its ability to produce goods and services
- Prices rise when the government prints too much money
- Society faces a short-run tradeoff between inflation and unemployment

1.6. Macroeconomics

R. E Boulding-*"macroeconomics is the study of the nature, relationship and behavior of aggregates and averages of economic quantities"*

Ackley-*"macroeconomics concerns itself with such variables as the aggregate volume of the output of an economy, with the extent to*

which its resources employed, with the size of national income, with the general price level"

1.7. Limitations of microeconomics

- Ignore the study of aggregates
- Unrealistic assumptions
- Ignore the role of government
- Limited scope

1.8. Difference between microeconomics and macroeconomics

Microeconomics	**Macroeconomics**
Microeconomics studies the individual or small economic variables of the economy such as individuals consumptions, saving, investment and income	Macroeconomics deals with aggregates like national income, full employment and price level
The main objective of microeconomics is to study the principles, problems and policies concerning the optimum allocation of resource	The main objective of macroeconomics is to study the principles, problems and policies relating to full employment and growth of resources
The subject matter of microeconomics is to study the determination of price, consumer's equilibrium, distribution and welfare etc. Hence it is also called price theory	The subject matter of macroeconomics is to study the process of determining employment, price level, national income, trade cycle etc. Hence it is also called income and employment theory
All microeconomics concepts and laws such as law of demand, law of supply, etc. and described by setting are formulated on	Macroeconomics assumes how the factors of production[economic resources] are distributed. It explains how full employment can

assumption such as full employment, constant production and income, ceteris paribus[other things being equal]. In other words, they establish relationship between cause and effect of microeconomic variables. This method of study is also known as the price equilibrium analysis	be achieve in market economy. The total effect of an economic factor on the economy is taken into account in macro-economic analysis. This method of study is also known as the price equilibrium analysis
Microeconomics studies the equilibrium between the forces of market demand and market supply. Hence the basis of microeconomics is the price mechanism	Macroeconomics analysis deals with the national income, output, employment etc. an such economic variables are determined at the point of equilibrium established between the forces of the whole economy[i.e. aggregate demand and aggregate supply]
The study of microeconomics is not much help to solve the important current issues and problem such as decline in national income, hyperinflation, widespread unemployment and so on	Macroeconomics studies the causes, effects and possible measures for the solution of these issues and problems. Macroeconomics help to solve these problems

1.9. Interdependence between microeconomics and macroeconomics

1.10. Dependence of microeconomics on macroeconomics

- Determination of product pricing
- Study of factor pricing

1.11. Dependence of macroeconomics on microeconomics

- Study of national income
- Study of general price level
- Study of total saving

2 THEORY OF DEMAND, SUPPLY AND EQUILIBRIUM PRICE

2.1 Demand function

Demand function establishes a functional relationship between price of a commodity[as an independent variable] and demand for a same commodity[as an dependent variable]

$Q_x=f(P_x)$

Q_x=demand for good

f=function of the consumer

P_x=price of goods

Types of demand function

- Linear demand function

If the slope of the demand curve remains constant throughout its length, it is known as **linear demand function**

$Q_x=a+bP_x$

Q_x=demand for good

f=function of the consumer

P_x=price of goods

a=demand at price zero or demand intercept

b=slope of demand curve or rate of change in demand with respect to change in price

- Non-linear demand function

<u>If the slopes of the demand curve changes with all along the demands curve. It is said to be **non-linear**</u>

$Q_x=aP_{x^{(-b)}}$

Q_x=demand for good

f=function of the consumer

P_x=price of goods

b=slope of demand curve or rate of change in demand with respect to change in price

2.2 Determinants of demand[factors affecting the demand]

- Price of commodity
- Price of related goods
  - Complimentary goods
  - Supplementary goods
- Income of the consumer
  - Normal goods
  - Inferior goods
- Advertisement
- Weather
- Customs

- Fashion
- Taste and preference of the consumer
- Money supply
- Tax rate
- Size of population

2.3 Movement along demand curve and shift in demand curve

- Movement along demand curve

A change in the quantity demanded refers to the movement from one point to another point on a fixed demand curve

- Shift in demand curve

A **shift in demand curve** occurs when a consumers are willing to purchase more or less of a commodity due to the change in other determinants of demand except the price of commodity

Factor causing the shift in demand curve

Description	**Rightward shift in demand curve**	**Leftward shift in demand curve**
Change in income **Normal goods** **Inferior goods**	Increase in income → Increase in demand Increase in income → Decrease in demand	Decrease in income → Decrease in demand Decrease in income → Increase in demand
Change in price of related goods **Substitute** **Complimentary**	Rise in price of Y goods → Rise in demand of X goods Rise in price of Y goods → Fall in demand of X goods	Fall in price of Y goods → Fall in demand of X goods Fall in price of Y goods → Rise in demand of X goods
Change in advertisement expenses	Rise in advertisement expenses → Rise in demand	Fall in advertisement expenses → Fall in demand

Change in tax rate	Fall in tax rate → Rise in demand	Rise in tax rate → Fall in demand
Change in size of population	Rise in size of population → Rise in demand	Fall in size of population → Fall in demand
Change in fashion	Goods are in demand → Rise in demand	Goods are not in demand → Fall in demand

2.4 Supply function

Supply function establishes a functional relationship between price of a commodity[as an independent variable] and supply for a same commodity[as an dependent variable]

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Q_x=supply for good

f=function of the consumer

P_x=price of goods

b=slope of supply curve or rate of change in supply with respect to change in price

2.5 Determinants of supply

- Price of commodity
- Price of related goods
- Technology and prices of inputs
- Future expectation
- Development of infrastructure
- Taxes and subsidies
- Natural factors

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Factor causing the shift in supply curve

Description	**Rightward shift in supply curve**	**Leftward shift in supply curve**
Change in cost of production	Fall in cost of production → Rise in supply	Rise in cost of production → Fall in supply
Change in price of related goods **Substitute** **Complimentary**	Rise in price of Y goods → Fall in supply of X goods Rise in price of Y goods → Rise in supply of X goods	Fall in price of Y goods → Rise in supply of X goods Fall in price of Y goods → Fall in supply of X goods
Change in goals of firm	Profit maximization to sell maximization → Rise in supply	Sell maximization to profit maximization → Fall in supply
Natural factors	Favorable effect → Rise in supply	Unfavorable effect → Fall in supply
Change in tax and subsidy	Low tax and more subsidy → Rise in supply	Heavy tax and less subsidy → Fall in supply
Technology	Technological advancement → Rise in supply	Dominance of primitive technology → Fall in supply

2.7 Determination of equilibrium price

The price at which the quantity demanded equals the quantity supplied is called **equilibrium price** because at this price two forces of demand and supply is exactly balance each other

2.8 Effect of change in market demand on equilibrium price at constant market supply

- Increase in demand at constant supply
- Decrease in demand at constant supply

2.9 Effect of change in market supply on equilibrium price at constant market demand

- Increase in supply at constant demand
- Decrease in supply at constant demand

2.10 Elasticity of demand

Elasticity of demand is the ratio of the percent change in the quantity demanded for the commodity to the percent change in any one of its determinants other thing being equal

$$E_d=\frac{percentage\ change\ in\ quantity\ demanded}{percentage\ change\ in\ price}$$

$$E_d=\frac{percentage\ change\ in\ quantity\ demanded}{percentage\ change\ in\ ay\ one\ quantative\ determinant\ of\ demand}$$

❖ Price elasticity of demand

Other thing being equal **price elasticity of demand** measures a degree of responsiveness in quantity demanded of a commodity due to change in price of same commodity

Ferguson-*"price elasticity of demand is the proportionate change in demand divided by the proportionate change in price"*

In forms of percent

$$E_d=\frac{percentage\ change\ in\ quantity\ demanded}{percentage\ change\ in\ price}$$

In symbolic form of percent

$$E_d=\frac{q2-q1}{p2-p1}*\frac{p1}{q1}$$

In terms of proportion

$$E_d=\frac{change\ in\ quantity\ demanded}{change\ in\ price}*\frac{initial\ price}{initial\ quantity\ demanded}$$

In symbolic form of proportion

$$E_d=\frac{\Delta q}{\Delta p}*\frac{p1}{q1}$$

In terms of derivatives

$$E_d=\frac{dQ}{dP}*\frac{P}{Q}$$

In terms of arc elasticity

$$E_d=\frac{change\ in\ quantity\ demanded}{change\ in\ price}*\frac{average\ price}{average\ quantity\ demanded}$$

In symbolic form of arc elasticity

$$E_d=\frac{\Delta q}{\Delta p}*\frac{p1+p2}{q1+q2}$$

Types of price elasticity of demand

- Perfectly inelastic demand($e_p<0$)
- Relative inelastic demand($e_p<1$)
- Unitary elastic demand($e_p=1$)
- Relative elastic demand($e_p>1$)
- Perfectly elastic demand($e_p=\infty$)

Relationship between price elasticity of demand and total outlay[composition of price elasticity of demand by total outlay method]

- Less than unity(e_p<1)
- Equal to unity(e_p=1)
- Greater than unity(e_p>1)

Movement of price elasticity of demand by point method

$$\mathbf{E_p}=\frac{\boldsymbol{lower\ segment}}{\boldsymbol{upper\ segment}}$$

Uses of price elasticity of demand

- Product pricing
- Price determination
- Pricing of input
- Pricing of joint product
- Demand forecasting
- To trade unionist
- Discount decision

❖ **Income elasticity of demand**

Other thing being equal **income elasticity of demand** measures a degree of responsiveness of the demanded for commodity due to change in income

In forms of percent

$$\mathbf{E_d}=\frac{\boldsymbol{percentage\ change\ in\ quantity\ demanded}}{\boldsymbol{percentage\ change\ in\ income}}$$

In symbolic form of percent

$$\mathbf{E_d}=\frac{\boldsymbol{q2-q1}}{\boldsymbol{y2-y1}}*\frac{\boldsymbol{y1}}{\boldsymbol{q1}}$$

In terms of proportion

$$E_d=\frac{change\ in\ quantity\ demanded}{change\ in\ income}*\frac{initial\ income}{initial\ quantity\ demanded}$$

In symbolic form of proportion

$$E_d=\frac{\Delta q}{\Delta y}*\frac{y1}{q1}$$

In terms of derivatives

$$E_d=\frac{dQ}{dY}*\frac{Y}{Q}$$

In terms of arc elasticity

$$E_d=\frac{change\ in\ quantity\ demanded}{change\ in\ income}*\frac{average\ income}{average\ quantity\ demanded}$$

In symbolic form of arc elasticity

$$E_d=\frac{\Delta q}{\Delta y}*\frac{y2+y1}{q1+q2}$$

Types of income elasticity of demand

- Positive income elasticity of demand($e_p>0$)
- Greater than unity($e_p>1$)
- Equal to unity($e_p=1$)
- Negative income elasticity of demand($e_p<0$)
- Zero income elasticity of demand($e_p=0$)

Measuring income elasticity of demand at a point on a linear demand curve

Point income elasticity of demand at non-linear demand curve

- **Cross elasticity of demand**

Other thing being equal **cross elasticity of demand** measures a degree of responsiveness of the demanded for X good to change in the price of Y good

In forms of percent

$$E_d=\frac{percentage\ change\ in\ demand\ for\ X\ good}{percentage\ change\ in\ price\ of\ Y\ good}$$

In symbolic form of percent

$$E_d=\frac{qx2-qx1}{py2-py1}*\frac{py1}{qx1}$$

In terms of proportion

$$E_d=\frac{change\ in\ demand\ for\ X\ good}{change\ in\ price\ of\ Y\ good}*\frac{initial\ price\ of\ Y\ good}{initial\ demand\ of\ X\ good}$$

In symbolic form of proportion

$$E_d=\frac{\Delta qx}{\Delta py}*\frac{py1}{qx1}$$

In terms of derivatives

$$E_d=\frac{dQx}{dPy}*\frac{Py}{Qx}$$

In terms of arc elasticity

$$E_d=\frac{change\ in\ demand\ for\ X\ good}{change\ in\ price\ of\ Y\ good}*\frac{average\ price\ of\ Y\ good}{average\ demand\ of\ X\ good}$$

In symbolic form of arc elasticity

$$E_d=\frac{\Delta qx}{\Delta py}*\frac{py2+py1}{qx1+qx2}$$

Types of cross elasticity of demand

- Positive cross elasticity of demand(e_p>0)
- Negative cross elasticity of demand(e_p<0)
- Zero cross elasticity of demand(e_p=0)

2.11 Price elasticity of supply

Other thing being equal **price elasticity of supply** is a measure of relative change in quantity supplied of a commodity in response to a relative change in its price

In forms of percent

$$E_d=\frac{percentage\ change\ in\ quantity\ supplied}{percentage\ change\ in\ price}$$

In symbolic form of percent

$$E_d=\frac{q2-q1}{p2-p1}*\frac{p1}{q1}$$

In terms of proportion

$$E_d=\frac{change\ in\ quantity\ supplied}{change\ in\ price}*\frac{initial\ price}{initial\ quantity\ supplied}$$

In symbolic form of proportion

$$E_d=\frac{\Delta q}{\Delta p}*\frac{p1}{q1}$$

In terms of derivatives

$$E_d=\frac{dQ}{dP}*\frac{P}{Q}$$

In terms of arc elasticity

$$E_d=\frac{change\ in\ quantity\ supplied}{change\ in\ price}*\frac{average\ price}{average\ quantity\ supplied}$$

In symbolic form of arc elasticity

$$E_d=\frac{\Delta q}{\Delta p}*\frac{p1+p2}{q1+q2}$$

Types of price elasticity of supply

- Perfectly inelastic supply($e_p<0$)
- Relative inelastic supply($e_p<1$)
- Unitary elastic supply($e_p=1$)
- Relative elastic supply($e_p>1$)
- Perfectly elastic supply($e_p=\infty$)

Movement of point price elasticity of supply

Point price elasticity of supply at non-linear supply curve

2.12 Comparison between price elasticity, income elasticity, cross elasticity, and supply elasticity

2.13 Demand schedule and demand curve

Demand schedule

- Individual demand schedule
- Market demand schedule

Demand curve

- Individual demand curve
- Market demand curve

Distinction between individual and market demand curve

- Individual demand curves are nearer to origin but market demand curve is farther from origin[or flatter]
- Individual demand curves are individual in nature but market demand curve is the horizontal summation of all individual demand curves
- Individual demand curves show the small quantity of demand for a commodity but market demand curve shows the large volume of quantity of demand for a commodity

2.14 Law of demand

Statement of the law

"other thing being equal, demand for a commodity varies inversely with price of same commodity"

Assumptions of the law

- No change in taste preference and fashion of the consumer
- No change in the level of income of the consumer
- Price of related goods remain fixed
- Size of population is fixed
- No change in advertisement expenses

Causes responsible for the operation of law

- Law of diminishing marginal utility
- Income effect
- Substitution effect
- Multiple uses

Exception of the law

- Giffen goods
- Article of distinction
- Ignorance
- Future expectation about prices
- Emergencies

2.15 Supply schedule and supply curve

Supply schedule

- Individual supply schedule
- Market supply schedule

Supply curve

- Individual supply curve
- Market supply curve

Distinction between individual and market supply curve

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- Individual supply curves show the small quantity of supply for a commodity but market supply curve shows the large volume of quantity of supply for a commodity

2.16 Law of supply

Statement of the law

"other thing being equal, supply of a commodity varies positively with price of same commodity"

Reason for the operation of law

- Why does supply increase due to increase in price
- Producers are ready to offer larger quantities from their old stock
- Due to the higher profit possibilities producers expend their production capacity and increase their production[supply]
- Due to the profit environment new firm enter in the market and increase the supply in the long run
- Why does supply decrease due to decrease in price
- Due to the lower profit possibilities producers contract their production capacity and decrease their production[supply]
- Producers are ready to keep the goods at the stock by withdrawing it from the market
- Due to the loss environment some inefficient firms may exit from the market and close down their production in the long run

Assumptions of the law

- There should be no change in the price of other goods
- Goals of the producers are fixed
- There is constant technology in production
- There should be no change in tax policy
- Price of factors of production remain constant

2.17 Determinants of price elasticity of demand

- Availabilities of substitutes
- Time period
- Nature of goods
- Proportion of income spent
- Number of uses of a commodity

2.18 Total expenditure and income elasticity of demand

2.19 Determinants of income elasticity of demand

- Proportion of income spent
- Level of income
- Time period

2.20 Uses of income elasticity of demand

➢ In business decision making

- Long term business planning
- Market strategy
- Housing development strategies

➢ Classification of goods

- When income elasticity(e_y) is positive, the commodity is normal
- If income elasticity coefficient is positive and greater than one($e_y>1$), the commodity is luxury
- If income elasticity coefficient is positive but less than one($e_y<1$), the commodity is an essential one
- When income elasticity(e_y) is negative, the commodity is inferior
- If income elasticity coefficient is zero($e_y=0$), the commodity is neutral and also very low priced item

2.21 Uses of price elasticity of supply

- Pricing of product
- Pricing of factor
- Taxation policy

2.22 Determinants of elasticity of supply

- Change in cost of production
- Time factor
- Nature of the commodity
- Availability of facilities for expanding output

3 THEORY OF CONSUMER BEHAVIOUR

3.1 Cardinal vs. total utility

- Total utility[TU]

Total utility is the average of marginal utilities

- Marginal utility

Marginal utility is the ratio of change in total utility with the change in units of consumption

- Average utility

Average utility is the average of total utility

3.2 Ordinal approach

Assumption

- The total utility of a consumer depends on the quantities of a commodities consumer
- Two wants are suitable at a time
- The consumer must be rational
- Ordinal measurement of utility is possible
- The consumer is consistent in his choice
- Transitivity
- Non-satiety
- There is operation of law of diminishing marginal rate of substitution
- Continuity

Indifference schedule[or preference schedule]

Prof Watson-*"An indifference schedule is a list of combinations of two commodities, a list being arranged that a consumer is indifferent to his combinations preferring none of any other"*

An **indifference curve** is a locus representing various combinations of two goods which yield same level of satisfaction to the consumer

IC map is a set of indifference curves

The law of diminishing marginal rate of substitutions[MRS]

MRS is a rate at which units of two goods are substituted each other to maintain same level of satisfaction

Causes for the operation of law of diminishing marginal rate of substitution

- Changes in intensity of wants
- Imperfect substitutions
- Assumption of MRS

Properties of indifference curve

- Indifference curve always slopes downwards from left to right
- IC convex to the origin
- Higher indifference curve yields higher level of satisfaction than lower ones
- Indifference curve do not intersect each other

Budget line or price line

A **budget line** is a locus representing various combinations of two goods that can be purchased by spending fixed income at given prices

Budget line reflects the price ratio between two goods and it shows the purchasing power of the consumer

Consumer equilibrium

A **consumer equilibrium** is define as a point where he has maximized the level of his satisfaction given his resources and other conditions

Assumption of consumer equilibrium

- Consumer must be rational
- Consumer must have budget line and indifference map
- Price of two goods remain unchanged
- Producer has to maximize utility by spending fixed budged on two goods

Conditions of consumer equilibrium

- Budget line should be tangent to the indifference curve
- Indifference curve should convex to the origin

Income effect and derivation of Engel curve[or income demand curve]

Income effect shows total effect on demand for goods due to change in income of the consumer other thing being equal

- Positive income demand curve

Positive income effect shows total effect on demand for normal goods due to change in income of the consumer other thing being equal

- Negative income demand curve

Negative income effect shows total effect on demand for inferior goods due to change in income of the consumer other thing being equal

Derivation of Engel curve

Engel curve shows the relationship between money income and money expenditure on a particular goods

Relationship between Engel curve and income elasticity of demand

- If the good is normal luxurious, Engel curve slopes upwards to the right as flatter and e_y is positive and greater than one
- If the good is normal necessities, Engel curve slopes upwards to the right as steeper and e_y is positive and less than one
- If the good is normal inferior, Engel curve slopes downwards to the right and e_y is negative

Price effect and derivation of price demand curve

Price effect shows total effect on consumer demand for a commodity due to change in price of same commodity other thing being equal

- Price effect on substitute goods
- Price effect on complementary goods

Substitution effect

Substitution effect occurs when a change in the relative prices of goods make a rational consumer induce to substitute relatively cheaper commodity for the dearer one

Hicksian approach

Slutsky approach

3.3 Decomposition of price effect into income and substitution effect

- Decomposition of price effect into income and substitution effect[normal goods]
- Decomposition of price effect into income and substitution effect[inferior goods]
- Decomposition of price effect into income and substitution effect[Giffen goods]

3.4 Comparison between cardinal approach and ordinal approach

➢ Similarities

- Rationality
- Introspective method
- Tool of analysis
- Measurement of utility

➢ Dissimilarities

- Critical approach does not explain the effect on consumer's demand due to change in price of a commodity income of a consumer and relative price of related goods i.e. price effect income effect and substitution effect respectively whereas ordinal approach does it
- Critical approach does not explain Giffen paradox or effect on consumer's demand for inferior good due to change in income whereas ordinal approach explains the phenomenon with the help of negative income effect
- Critical approach state that consumer can satisfy only one want related to single or two or more than two goods of same commodity group at a time. Hence this approach is considered as **one commodity model**. But ordinal approach state that consumer can

satisfy two wants at a particular period of time. Hence this approach is considered as **two commodity model**

- Critical approach is based on some unrealistic assumptions such as cardinal measurement of utility, marginal utility of money remains unchanged, utility is independent etc. Whereas ordinal approach is based on some realistic assumptions such as ordinal measurement of utility, non-satiety nature of consumer and application of law of diminishing marginal rate off substitutions etc.
- Critical approach explains the principle of consumer's surplus by setting the assumption of cardinal measurement of utility which is unrealistic whereas ordinal approach explains this principles by setting the assumption of ordinal measurement of utility which is realistic

➢ Criticism of indifference curves

- The indifference curve has a week structure. Although it is based on the assumption of stability of consumer's tastes and preference, the entire edifice of indifference map collapses and the analysis becomes meaningless if tastes and preference change due to some influences like advertisement propaganda, fashion and so on
- The indifference curve analysis has basic limitations of geometrical dimensions. Thus, it cannot be easily extended to more than two goods
- It provides only a psychological explanation of consumer behavior. It is not amenable to empirical tests. Again the functions involved in the indifference curve analysis are incapable of statistical verification
- The difference curve analysis may look absurd in the case of bulky goods which are not divisible when we think $\frac{1}{3}$ of TV set combine with $1\frac{1}{2}$ of refrigerators and so on

- Professor Armstrong points out that in drawing the indifference curve. Hicks assume transitivity and continuity. Actually, indifference curves are non-transitivity. An indifference curve is transitive if we see that the utility difference at different points of an indifference curve is not perceptible to the consumer. This may be true with very close points on an indifference curve
- Ordinal utility theory is not capable of formalizing consumer's behavior when his preferences involve risk or uncertainty in expectation

4 THEORY OF PRODUCTION

4.1 Production function

Production function establishes a functional relationship between input and output

A. Koutsoyinais-*"the production function is purely a technological relation which connects factor inputs and output"*

Prof Leontief-*"a production function is a description of the quantitative relationship between the inputs absorbed and the outputs emerging from a particular production process"*

Q=f(N)

Where

Q=output

f=function

N=input

Some basic concept of production function

- Production function establishes a functional relationship between input[as independent variables] and output[as dependent variables]
- Production function is a flow of inputs resulting in a flow of output over some specified period of time
- It expresses a physical relation because both inputs and output are expresses in physical terms
- It describes a purely technological relation between inputs and output

Types of production

- Short run[one variable input] production function

Short-run production function establishes a functional relationship between variables inputs with constant units of fixed input and output

- Fixed inputs

Fixed inputs are those inputs which cannot be changed as required

- Variable inputs

Variable inputs are those inputs which can be changed as required

- Long run[multi-variable inputs] production function

Long-run production function establishes a functional relationship between all inputs and output

4.2 Cobb-douglas p production function

Cobb-douglas production function reveals total effect on output with the employment of $3/4^{th}$ proportion of labour and $1/4^{th}$ proportion of capital

$Q=AL^{\alpha}K^{\beta}$

Q=output

L=labour

K=capital

A α and β are constant parameters

<u>Cobb-douglas production helps to compute factor intensity, efficient of production, degree of returns to scale and marginal productivities of inputs, MRTS and so on</u>

Properties

- Factor intensity

$\frac{\alpha}{\beta}$>1 it is labour insensitive

$\frac{\alpha}{\beta}$<1 it is capital insensitive

- Efficiency of production

Higher the value of A, the higher degree of efficiency of production

Lower the value of A, the lower degree of efficiency of production

- Returns to scale

Let α+β=V

If V>1, there is operation of increasing returns to scale

If V=1, there is operation of constant returns to scale

If V<1, there is operation of decreasing returns to scale

- Average productivities of inputs

Average productivity of labour=$\frac{\mathbf{AL\alpha K\beta}}{L}$

Average productivity of capital=$\frac{\mathbf{AL\alpha K\beta}}{K}$

- Marginal productivities of inputs

Marginal productivity of labour=α(AP_L)

Marginal productivity of capital=β(AP_K)

- The marginal rate of technical substitution

$MRTS_{LK}$=$\frac{\alpha}{\beta}*\frac{K}{L}$

$MRTS_{KL}$=$\frac{\beta}{\alpha}*\frac{L}{K}$

- The elasticity of technical substitution

б=$\frac{d(L/K)/(K/L)}{d(MRTS)/(MRTS)}$**=1**

4.3 Law of variable proportion

The law of variable proportions reveals total effect on output with a proportionate change in one variable input with constant units of fixed inputs

Benham-*"as the proportion of one factor in a combination of factors is increased, after a point, first the marginal product and then the average product of that product will diminish"*

Stigler-*"as equal increment of one input are added, the inputs of other production services being yield constant, beyond a certain point the*

resulting increments of product will decrease, i.e. marginal product will diminish"

Law of variable proportion explains three effects on output: increasing returns, diminishing returns and negative returns

Assumption

- All laborers are homogenous
- Technology remains unchanged
- It is possible to make proportionate change in the use of variable inputs with the use of fixed inputs

Different product in different stage

Stage	Total product	Average product	Marginal product
1st	First in increase at increasing rate Then the rate of increase switches from increasing to diminishing	Increase Become maximum	Increase At a maximum begins to diminish
2nd	Continues to increasing at diminishing rate Eventually becomes maximum	At the maximum(=MP) and then begins to diminish Continues to diminish	Continues to diminish Becomes zero
3rd	Diminishing	Continues to diminish	Is negative

A rational producer seek in II stage

A rational producer seek his production process at a point where TP is maximum[or TP is maximum with zero MP]

- At stage I, fixed inputs are not utilized at full capacity
- At stage III, TP is decreasing and MP is negative

4.4 Iso-Quant

An **Iso-Quant** is a locus representing various combinations of two inputs which yield same level of output to the consumer

Due to the diminishing MRTS, IQ slopes downwards to the right as rectangle hyperbola

Assumption

- Only two inputs, labour[L] and capital[K] are assumed to be variable and substitutable each other
- There is operation of law of diminishing marginal rate of technical substitution between two inputs
- Production function is continuous, implying that labour and capital are perfectly divisible and can be substituted in any small quantity
- Producer has production preference schedule
- Producer must be rational
- Transitivity: A→B, B→C then A→C

Iso-Quant map

IQ Map is a set of Iso-Quants. It shows the producer's preference

4.5 Law of diminishing marginal rate of technical substitution[MRTS]

MRTS is a rate at which units of two inputs are substituted each other to maintain same level of output to the producer

Q=f(K,L)

Q=output

f=function

K=capital

L=labour

Conclusion of law

- MRTS shows the shape of Iso-Quant
- MRTS is also define as the ratio between marginal productivities of two inputs
- The slope of Iso-Quant also reflects the ratio between marginal productivities of two inputs
- The trend of MRTS is diminishing. Due to diminishing MRTS, the Iso-Quant has a negative slope and any points lying on such curve yield same level of output to the producer

4.6 Properties of Iso-Quant

- Iso-Quant always slopes downwards to right
- Iso-Quant convex to the origin
- Higher Iso-Quant yields higher level of output than lower ones
- Iso-Quant never intersect each other

4.7 Iso-Cost line[price line]

An **Iso-cost line** is a locus representing various combinations of two inputs that can be hired by fixed total cost outlay at given price

$$P_K.Q_K + P_L.Q_L = C$$

C=investment budget

P_K=price of capital

Q_K=units of capital

P_L=price of labour

Q_L=units of labour

Conclusion

- Any combination lying on Iso-Cost line can be hired by investing fixed total cost outlay. Hence, it shows the investment capacity of the producer
- Any combination lying outside the Iso-Cost line[such as M] are unattainable or beyond the investment capacity of the producer
- Any combination lying inside the Iso-Cost line are attainable but not desirable or rational
- An Iso-Cost line slopes downwards to right

Shift in Iso-Cost line

4.8 Optimal combination of two inputs or least cost combination of two inputs or producer's equilibrium

A producer is said to be in equilibrium when he is hiring such a combinations of two inputs that leaves him with no tendency to rearrange the inputs

- Maximization of output at given total cost outlay

Assumptions

- Producer must have Iso-Quant map and Iso-cost line
- Producer must be rational

- Total cost outlay and price of two goods remain fixed
- Producer has to maximize output by investing fixed total cost outlay on two inputs[i.e. labour and capital] at minimum cost

Conditions

- **Necessary[1st order] condition**: Iso-cost line is tangent to the Iso-Quant[or the slope of Iso-Quant equals o the slope of Iso-cost line] i.e. $MRTS_{KL}=MP_K/MP_L=r/w$
- **Sufficient[2nd order] condition**: Iso-Quant convex to the origin

Why does producer not attend equilibrium at higher Iso-Quant i.e. IQ_3

→ According to the concept of Iso-Quant map, higher Iso-Quant[i.e. IQ_3] yields higher level of output IQ_2 and so on. Hence, producer also tries to attend equilibrium at such IQ. However any combination lying on such IQ[i.e. IQ_3] are unattainable[beyond the investment of the producer]. Thus, he could attain equilibrium at higher Iso-Quant, IQ_3

Why does producer not attend equilibrium at any point lying on IQ_2 except E

→ Any combination lying on IQ_2 yields same level of output[i.e. $TP_1=TP_2=TP_3$]. However, all other combinations except E are lying outside the Iso-Cost line or beyond the investment capacity of the producer. Hence, he could attain equilibrium at any point lying on IQ_2 except E

Why does producer not attend equilibrium at intersect between IQ_1 and Iso-cost line? Why is tangency needed

→ AB is Iso-Cost line and IQ_1, are intersect at R and S combination respectively. Combination R contains more units of labour and less

units of capital. Here, the producer substitutes capital for labour. Combination S contains more units of capital and less units of labour. Here, the producer substitutes labour for capital. The process of substitution will be continued until the point where the slope of Iso-Quant equals to the slope of Iso-Cost line. Similarly, cost or investment required on hiring all combination lying on IQ_1 is same but output obtained from combination E is greater than other combinations i.e. $C_E=C_R$ but $Q_E>Q_R$ and $C_E=C_S$ but $Q_E>Q_S$. Hence, tangency between Iso-Cost line and Iso-Quant is the required condition for maximizing output at given total cost outlay

Changes in total cost outlay and expansion path

- Minimization of cost at given production quota

Assumptions

- Producer must have Iso-Quant map and Iso-cost line
- Producer must be rational
- Price of two goods remain fixed
- Producer has different level of investment or total cost outlay
- Producer has to produce given level of output at minimum cost

Conditions

- **Necessary[1st order] condition**: The slope of Iso-cost line is equal to the Iso-Quant
- **Sufficient[2nd order] condition**: Iso-Quant convex to the origin

4.9 Laws of returns to scale

Return to scale reveals the total effect on output with proportionate variation in all inputs

- Increasing returns scale[IRS]

Law of IRS operates when the percent change in output is greater than the percent change in input

Causes

- Indivisibilities
- Greater specialization
- Dimensional relation

- Constant returns scale[CRS]

Law of CRS operates when the percent change in output is equals to the percent change in input

Causes

- Limitation of the economies of scale
- Divisibility of inputs

- Decreasing returns scale[DRS]

Law of DRS operates when the percent change in output is less than the percent change in input

Causes

- Complexity of management
- Entrepreneur being a fixed factor
- Exhaustibility of natural resources

4.10 Production

Characteristics of factor of production

- Land

Alford Marshall-*"by land not merely land in strict sense of the word, but whole of the materials and forces, which nature gives freely for man's aid in land and water"*

Land consist the following

- Upper surface of earth with its properties and the forest growing on it naturally
- Mountains, oceans, rivers, lakes, ponds and things found on them
- Materials found under surface of earth
- Climate, wind, sunshine, sunlight, heat etc.

Characteristics

- Free gift of nature
- Limited in supply
- Not perishable
- Immobile
- Heterogeneous in nature
- Passive factor

➢ Labour

Alford Marshall-*"by labour is meant the economic work of man with hand or head"*

S.E. Thomas-*"all human efforts of body or of mind which are undertaken in the expectation of reward"*

Labour refers……

- Human work and not the work done by machines and animals
- Physical or mental work

- Productive activity
- The aim of earning reward

Efficiency of labour

Penson-*"an efficiency of labour depends partly on the employer and partly on the employed, partly on organization and partly individuals efforts, partly on tools and machines etc. with which the workers is supplied and partly on his own skill and industry in making the use of them"*

Division of labour

- Capital

Alford Marshall-*"capital consists of those kinds of wealth, other than the free gift of nature, which yields income"*

S.E. Thomas-*"capital is the part of wealth of individuals and of communities other than land, which is used to assist in the production of further wealth, i.e. tools, implements, machinery, seeds, raw materials and transport instruments"*

- Organization

Wheeler-*"a concern, company or enterprise which buys and sells, is owned by one person or group of persons and is managed under a specific set of operating policies"*

Classification of organization

- Private sector undertakings
- Public sector undertakings

A.H. Hanson-*"public enterprises mean state ownership and operation of industrial, agricultural, financial and commercial undertakings"*

- Joint sector undertakings

J.R.D Tata-*"a joint stock enterprise is intended to be a form for partnership between the private sector and the government in which Government participation of the capital will be less than 26 percent, the day-to-day management will normally be in the hand of the private sector partner and control and supervision will be exercised by a board of directors on which government is adequately represented"*

5 COST AND REVENUE CURVES

5.1 Meaning of cost and cost function

Cost function refers to the mathematical expression of the relationship between output and cost of production

C=f(Q)

Where

Q=output

f=function

C=cost

Types of cost

- Money cost

Money cost refer to costs incurred on purchasing or hiring productive factor services

- Explicit and Implicit costs
  - Explicit costs

Explicit cost refer to all types of machinery expenses incurred on those inputs which are owned by outsiders except producers

  - Implicit costs

Implicit cost refer to all types of estimated costs incurred on those inputs which are owned by producer himself

- Opportunity cost[alternative cost]

An opportunity cost is define as the minimum economic value that induce an input to remain its present use

Significances

  - Determination of relative price of good
  - Determination of normal remuneration to a factor
  - Decision making and efficient resource allocation
- Accounting and economic cost
  - Accounting cost

Accounting cost refer to all types of explicit costs recorded in accounting cost

  - Economic cost

Economic costs are the aggregate of explicit costs and implicit costs

Accounting cost= Economic cost[money cost]

Economic cost= Explicit costs + Implicit costs

Economic cost= Accounting cost + [Imputed cost + normal profit[normal rate of return to the entrepreneur]]

- Traceable[separable] and common cost
- Replacement and historical cost

Dean-*"historical cost valuation state cost of plant and materials, for example, at the price originality paid for them, whereas replacement cost valuation state cost at price that would have to be paid currently"*

5.2 Short run costs and cost curves

Short run costs

- Total fixed cost[TFC]

Fixed cost refer to all types of money cost incurred on fixed factors of production employed on the use production process

- Total variable cost[TVC]

Variable cost refer to all types of cost incurred by the firm on the use of variable factor

Difference between fixed and variable cost

Fixed cost	**Variable cost**
All types of cost incurred on fixed inputs	All types of cost incurred on variable inputs
They do not vary with the change in level of output	They vary with the change in level of output
They are always greater than zero	When output is zero or production is close, they will be zero
A firms gives continuity in production even at the loss of	A firms gives continuity in production only if there is no loss

fixed cost	of variable cost
They are unavoidable	They are avoidable

- Total cost[TC]

Short-run total cost is the aggregate total fixed cost and total variable cost

Why does TC or TVC increasing at a diminishing rate initially and increasing rate later

OR

Why does TC curve or TVC curve slope upwards, to the right, as inverse 'S' shape

→ The behavior of the TC curve or TVC curve follows directly from the law of variable proportions. The total variable cost or total cost increases first at a diminishing rate due to the application of increasing returns and then at increasing rate due to the application of diminishing returns. Therefore TC curve or TVC curve slope upwards, to the right, as inverse 'S' shape due to the application of law of variable proportions

Relationship between TP and TC curves

- When TP increases at an increasing rate due to higher degree of production efficiency, TC increases at a decreasing rate
- When TP increases at a decreasing rate due to lower degree of production efficiency, TC increases at an increasing rate

- Average fixed cost[AFC]

AFC is the outcome of total fixed cost divided by total produced quantity

AFC=$\frac{TFC}{Q}$

- Average variable cost[AVC]

AVC is the outcome of total variable cost divided by total produced quantity

AVC=$\frac{TVC}{Q}$

- Average cost[AC]

Average cost is the outcome of total cost divided by total produced quantity. It is also define as the sum of AFC and AVC

AC=AFC+AVC

Relationship between AC AFC and AVC

- At the initial phase of production both AFC and AVC falls, then AC also falls
- At the initial phase of production both AFC falls, AVC rises, then the trend of AC depends upon the rate of change in AFC and AVC
  - If rate of fall in AFC > rate of rise in AVC, AC falls
  - If rate of fall in AFC < rate of rise in AVC, AC rises
  - If the rate of fall in AFC = rate of rise in AVC, AC reaches at its minimum and constant
- Short run marginal cost[SMC]

Short run marginal cost is the ratio of the change in the total variable cost with the change in output

MC=$\frac{\Delta TVC}{\Delta Q}$

Graphical explanation of average and marginal cost curves

- When average product rises, AVC falls
- When average product falls, AVC rises

Why AC curve slopes U-shaped

→

Relationship between AP and AC

- When AP increases, AC decreases
- When AP decreases, AC increases
- When AP reaches at its maximum, AC reaches at its minimum

Some point based on law of variable proportions

- When marginal product increases, marginal cost decreases
- When marginal product decreases, marginal cost increases
- When marginal product reaches at its maximum, marginal cost reaches at its minimum

Relationship between MP and MC

5.3 Cost-output relationship

Relationship between AC with AVC and AFC

Relationship between TVC and MC

Relationship between SAC and SMC

5.4 Long run costs and cost curves

Long run average cost curve[LAC]

LAC is the focus of points denoting the least cost of producing the corresponding levels of output with plants of different size

Characteristics of LAC

- Tangent curve
- Envelop curve
- Decision making curve
- Planning curve
- U-shaped curve
- It is less pronounced then SAC's

Derivation of long run average cost curve[LAC]

- LAC is derived by joining or targeting the minimum cost points or the possible minimum cost points of plants which can be brought under operation in the short-run production function. Hence it is also called tangent curve
- It is the locus of points denoting the least cost of producing the corresponding levels of output with plants of different size
- It is also called the envelop curve because it enclosed[or envelops] the whole family of short-run cost curves
- It is also called decision making curve because on the basis of this curve that the firm decides what plant to set up in order to produce the expected level of output at a minimum cost
- Firm makes a plan about a plan about plant size and level of output with the help of LAC. Hence it is also called planning curve
- LAC is U-shaped

Why slopes LAC U-shaped

- When increasing returns to scale operates, the average product increases, the average cost decreases
- When decreasing returns to scale operates, the average product decreases, the average cost increases
- Due to the constant returns to scale, the average product becomes maximum and constant and the average cost becomes minimum and constant

Why LAC is less pronounced then SAC's

- The degree of economies of scale in long-run is greater than the degree of economies of scale in short-run
- The degree of diseconomies of scale in long-run is less than the degree of economies of scale in short-run

Derivation of long run marginal cost curve[LMC]

5.5 The L-shaped scale curve[Empirical Evidence of LAC]

5.6 Meaning and types of revenue

- Total revenue[TR]

TR=Q*P

Where

Q=quantity

P=price

TR=$\sum MR$

- Marginal revenue[MR]

MR=$\frac{\Delta TR}{\Delta Q}$

$MR=TR_n-TR_{n-1}$

- Average revenue

MR=$\frac{TR}{Q}$

=$\frac{P*Q}{Q}$

=P

5.7 Revenue under perfect competition

Under the perfect competition, TR varies positively and proportionately with output at constant price but both AR and MR remain constant at any level of output

Demographic representation

Relation between AR and MR

→ Since TR varies positively and proportionately with output, MR remain constant. In other words, MR shows the rate of change in TR with respect to change in output[MR=$\frac{\Delta TR}{\Delta Q}$]. Hence, MR remain constant when TR increase at constant rate

5.8 Revenue under imperfect competition

Under imperfect competition, total revenue increased at a diminishing rate with an increase in output at same rate. But, both average and marginal revenue fall continuously

Relation between TR and MR

→ Under both market, monopoly and monopolistic competition, TR increased at a diminishing rate as output increase. Thus, MR decreases continuously as output increase

Relation between AR and MR

5.9 Relationship between price elasticity of demand and revenues

5.10 Causes responsible for U-Shaped LAC

❖ Internal economies/diseconomies

➢ Internal economies

- Technical economies
  - Use of superior technique
  - Greater specialization
  - Use of By-Product
- Economy of bigger dimension
- Managerial economies
- Marketing economies
- Financial economies
- Economies in transport and storage
- Research
- Risk and survival economies

➢ Internal diseconomies

- Managerial diseconomies
- Labour inefficiency
- Technical diseconomies

❖ External economies/diseconomies

➢ External economies

- Cheaper inputs
- Technological economies

- Supply of skilled labour
- Growth of ancillary industries
- Constant flow of information
- Economies of localization

➢ External diseconomies

- Rise in input prices
- Higher wages
- Costlier transport

❖ Economies of scope

Economies of scope refer to a process of per unit cost reduction that occurs when a firm produces two or more products instead of just one product

Pappas and Brigham-*"a firm will produce products that are complimentary in the sense that producing them jointly is less costly than individual production"*

Salvatore-*"the lowering of costs that a firm often experience when it produces two or more products together rather than producing each product separately"*

Causes of arising Economies of scope

- Utilization of By-Product
- Utilization of physical infrastructures
- Utilization of manpower

DES=$\frac{C(A)+C(B)-C(A+B)}{C(A+B)}$

Where

DES=degree of economies of scope

C(A)=cost of producing product A separately

C(B)=cost of producing product B separately

C(A+B)=cost of producing product A and B jointly

6 THEORY OF PRODUCT PRICING

6.1 Characteristics of Market structure

- The number of firms that make up the market
- The ease with which new firms may enter the market and begin producing the good service
- The degree to which the products produced by the firms are different
- The knowledge about market acquired by both consumers and sellers[i.e. perfect or imperfect]

6.2 Perfect competition

Perfect competition is that market structure in which there is large number of sellers and buyers of homogenous products and products are perfect substituted each other

Characteristics

- Large number of buyers and sellers
- Product homogeneity with perfect substitutes
- Free entry and exits of firm
- Perfect knowledge
- Perfect mobility of factors of production
- Horizontal sloping demand curve
- No government regulation

- Absence of transport cost
- Objective of firm

6.3 Monopoly

Monopoly refer to a market structure in which a single firm produce product without any close substitutes and entry of new firms is blocked

A. Koutsoyinais-*" Monopoly is a market structure in which there is a single seller, there are no close substitutes for the commodity it produces and there are barriers to entry"*

Leftwitch-*"pure monopoly is a market structure in which a single firm sells a product for which there is no good substitutes"*

Causes for rising monopoly

- Strategic raw material
- Patent rights
- Limit pricing policy
- Existence of goodwill
- Legal restrictions
- Local monopolies
- Optimum scale of plant

Features

- Single seller and large number of buyers
- No close substitutes
- Barriers to entry of firms
- Imperfect knowledge about market
- Price maker
- Nature of demand curve

- Objective of firm

6.4 Monopolistic competition

Monopolistic competition is that form of market in which there are many sellers of a particular product but each seller sells somewhat differentiate product

Characteristics

- Large number of buyers and many sellers
- Differentiate products
- Imperfect knowledge about market
- Free entry and exits of firm
- Non-price competition and selling cost
- Negative sloping demand curve
- The goal of the firm is to maximize the profit, both in the short-run and in the long-run
- The prices of factors and technology are given
- Finally, Chamberlin makes the heroic assumption that both demand and cost curves for all products are uniform throughout the group

Non-price competition and selling cost

Selling cost

According to Chamberlin, selling cost include

- Cost of advertisement
- Expenditure on sales promotion schemes[include gifts and discounts to byers]
- Salary and commission paid to sales personnel
- Allowance to retailers for displays and cost of after-sale-services

Function

- Informing potential buyers about the availability of product

- Increasing demand for the product by attracting consumers of rival products
- To make the demand curve shift upward

Effectiveness depends on

- Price of the product
- Price of the substitute
- Buyer's income
- Buyers' loyalty to rival brands

Distinction between selling cost and production cost

- Cost of production includes all the expenses which must be incurred in order to provide the goods or service, transport it to the buyer and place it into his hand ready for consumption. Cost of selling, on the other hand, includes all expenses incurred to obtain demand or a market for the product
- Production costs are meant to create utilities which would satisfy the latent demand of the buyers. Selling cost, on the other hand, are meant to create and shift demand for the product
- Production costs meant to adapt the product to demand, while selling cost are undertaken to adapt demand to the product. In other words, production costs manipulate the product, selling costs manipulate demand
- Increase in the cost of production decreases the supply of the product. Increase in the selling cost increases the demand for the product
- Production costs and selling costs exert their effect on prices in different directions. When production costs increase[assuming factor prices as given], the volume of output supplied increases. Hence, in the context of a given demand for a product results in the fall of market price. While if additional selling cost are incurred, additional demand for a product is created which in turn, causes the market price to rise

6.5 Oligopoly

Oligopoly is a form of market organization in which a few sellers[firms] produce either homogenous or differentiate product

Factor causing

- Huge capital investment
- Economies of scale
- Patent rights
- Control of certain raw materials
- Merger and takeover

Features

- Small number of sellers
- Nature of product
- Interdependence of decision making
- Barriers to entry
- Non-price competition and selling cost
- Indeterminate price and output
- Imperfect knowledge about market

6.6 Profit maximum and equilibrium of a firm

Total revenue-Total cost approach

Marginal revenue-Marginal cost approach

- If AR>AC, abnormal profit
- If AR=AC, normal profit
- If AR<AC, abnormal loss

6.7 Equilibrium price and output determination under perfect competition

Price determination

Output determination

Short-run equilibrium

- If AR>AC, abnormal profit
- If AR=AC, normal profit
- If AR<AC, abnormal loss

Long-run equilibrium

- If AR=AC, normal profit

6.8 Derivation of short-run supply curve of perfectly competitive firm

The portion of the firm's marginal cost curve which lies from and above its minimum point of AVC curve is its short-run supply close down point

6.9 Price and output determination under monopoly

Job of firm

- To determine level of output
- To determine price

Short-run equilibrium depends on

- Its cost and revenue conditions
- Threat from potential competition or purchase of remote substitutes
- Government policy in respect of monopoly

Short-run equilibrium

- If AR>AC, abnormal profit
- If AR=AC, normal profit
- If AR<AC, abnormal loss

Long-run equilibrium

- If AR>AC, abnormal profit

6.10 Equilibrium price and output determination under discriminating monopoly

Price discrimination

Price discrimination refer to a situation when a producer sells the same product to different buyers[at different sub-market] at different price

Some examples of price discrimination

- Doctor are able to separate patients with high income from those with low income and change higher fee from the former
- Some countries dump goods at low prices to capture foreign market and high price at domestic market
- Railway or air services charge different prices to different grades of seats like business class and economic class
- Telephone companies charge different prices on different telephone product like high price for business hour and low price for off hour[postpaid and prepaid cell phone]
- Cinema halls charge higher prices to special seats like balcony or dress-circle and lower prices to common seats like 1^{st} class, 2^{nd} class etc.

- Nepal electricity authority charge higher prices to household sector than industrial sector. It has also charged higher price to high income groups and lower price to low income groups

Conditions for price discrimination

- The seller should have some control over the supply of his product, i.e. monopoly power on its product is necessary to determine price
- The market must be divided into sub-markets with different price elasticities
- There must be effective separation of the sub-markets, so that no reselling can take place from a low-price market to a high-price market. If those who buy in the low price segment of the market can easily resell in the high price segment, the resulting decline in supply would increase price in the in the low price segment and the increase in supply would lower the price in the high price segment. The price discrimination policy would thereby undermine. This condition shows why price discrimination is easier to apply with commodities like electricity or gasoline[due to lack of distribution channels and exclusive use of services like service of a doctor, transport, a show], which are consumed by the buyer and cannot be resold

Degree of price discrimination

- 1st degree discrimination
- 2nd degree discrimination
- 3rd degree discrimination

Decision for price discrimination

- To determine level of output

- To determine price and sales quantity at each market

Economic effects of price discrimination

➢ Positive

- According to Mrs. John Robinson, total output under price discrimination tends to be larger than the output under a simple monopoly with a uniform price policy
- Total profits of the discriminating monopolist will be higher than that of the simple monopolist. It is because price discrimination at least partially helps the monopolist in converting the consumer's surplus into a profit
- Price discrimination helps increase the sales and the output, as such, large scale of production and minimize the costs
- Socially justified price discrimination under which the poor buyers are charged lower prices, helps in improving the economic welfare of the commodity at large
- In a widening market, in the case of dumping, the exporting firm can reap the advantage of the economies of large scale plant size in operation

➢ Negative

- Price discrimination of the first and second degrees obstruct the maximization of utility
- Price discrimination leads to inefficient allocation of resources in a market economy
- Price discrimination can also be inequitable when the richer consumers at the cost of the poor

Dumping

The art of selling a commodity at a lower price in a foreign market and at higher in the home market is called **dumping**

Objectives

- To compute our rivals in the foreign market
- To secure advantages of increasing returns
- To create demand for his product in the foreign market
- To explore the new markets
- To get rid of surplus stock of the product
- To take advantage of the difference in the elasticities of demand

Is monopoly price always higher?

- Investment on research and experiment
- Internal economies of scale
- Restraints on monopoly price fixation

Reasons for restraints on monopoly price fixation

- The monopolist may be afraid of the boycott from the consumer if he fixed high price. It is possible due to the presence of remote substitutes
- Due to the possibility of government regulation, the monopolist may knowingly or unknowingly fix low price. It implies that government may nationalize the company or follow the limit pricing policy if monopolist becomes more exploitative by charging high prices

6.11 Price and output determination under monopolistic competition

- To determine level of output
- To determine price
- To formulate sales strategies

Short-run equilibrium

- If AR>AC, abnormal profit
- If AR=AC, normal profit
- If AR<AC, abnormal loss

Long-run equilibrium

- If AR=AC, normal profit

6.12 Comparison between perfect competition and monopoly

Similarities

- Objective of firm-profit maximization
- Conditions for firm equilibrium:
  - MC=MR
  - Slope of MC> Slope of MR
- Nature of average and marginal cost curves=U shaped
- No. of consumers=Large

Difference

Perfect competition	**Monopoly**
Nature of product is homogenous with perfect substitutes	Nature of product is simple with no substitutes
It has horizontal sloping demand curve	It has negative sloping demand curve
Firm is price taker	Firm is price maker
It has price competition	It has no competition
Free entry and exits of firm	Barriers to entry
Knowledge about market is perfect	Knowledge about market is imperfect
There is normal profit in long run	There is abnormal profit in long

	run
There is optimal utilization of plant capacity	There is sub-optimal utilization of plant capacity
There is no government regulation	There is government regulation

6.13 Comparison between perfect competition and monopolistic competition

Similarities

- Objective of firm-profit maximization
- Conditions for firm equilibrium:
  - MC=MR
  - Slope of MC> Slope of MR
- Nature of average and marginal cost curves=U shaped
- No. of consumers=Large
- Free entry and exits of firm
- Normal profit in long run

Difference

Perfect competition	**Monopolistic competition**
Nature of product is homogenous with perfect substitutes	Nature of product is differentiate with close substitutes
It has horizontal sloping demand curve	It has negative sloping demand curve
Firm is price taker	Firm is price maker
It has price competition	It has non-price competition
Knowledge about market is perfect	Knowledge about market is imperfect
There is optimal utilization of plant capacity	There is sub-optimal utilization of plant capacity

There is no government regulation	There is government regulation
There is large number of firm	There is many number of firm

6.14 Comparison between monopolistic competition and monopoly

Similarities

- Objective of firm-profit maximization
- Conditions for firm equilibrium:
  - MC=MR
  - Slope of MC> Slope of MR
- Nature of average and marginal cost curves=U shaped
- No. of consumers=Large
- Negative sloping demand curve
- Imperfect knowledge about market
- Government regulation
- There is sub-optimal utilization of plant capacity

Difference

Monopolistic competition	**Monopoly**
There are many sellers	There is single seller
Nature of product is homogenous with perfect substitutes	Nature of product is simple with no substitutes
It has non-price competition	It has no competition
Free entry and exits of firm	Barriers to entry
There is normal profit in long run	There is abnormal profit in long run

7 THEORY OF FACTOR PRICING

7.1 Rent

Rent is the part of the national income which goes to land as a factor of production

Types of rent

- Contract rent

The total payment made by the tenant to the landlord is called **gross rent** or **contract rent**

- Economic rent

Economic rent is the residual amount of the gross rent by deducting other various amounts

Modern theory of rent

John Robinson-*"the essence of the rent is the conception of a surplus earned by a particular part of a factor of production over and above the maximum earnings necessary to induce it to its work"*

Proposition of theory

- Economic rent is derive from all factors of production
- Economic rent is the difference between actual earnings and transfer earnings of resources
- Economic rent is determine by the interaction between demand for factors and supply of factors
- Economic rent is the result of specificity nature of resources[scarcity of resources and relative importance in different productive use

Economic rent=Actual earning-Transfer earning

Demand for factors[inputs]

Supply of factors

- When factor supply is perfectly inelastic
- When factor supply is perfectly elastic
- When factor supply curve is positively slope

Summary of modern theory of rent

- According to Mrs. John Robinson-*"rent is a surplus over the minimum supply price[transfer earnings] of the factor"*
- Actual earning is the earning obtain from present use of resources
- The transfer earnings refer to the amount of money, which a factor of production could earn in its next best-paid use. It may also be define as the amount that a factor must earn to remain in its present occupation
- Rent is derived from all factors of production. Any factors of production[It may be land, labour, capital or organization] will yield rent if its supply is inelastic or elastic in relation to its demand
- The theory states that rent arises due to the relative scarcity of a factor in relation to its demand. Hence, it is also called scarcity theory of rent
- Rent is the result of the interaction of the forces of demand and supply of inputs
- The demand for land is derive demand
- Supply of land is permanently inelastic in the short-run as well as in the long-run
- Supply of other factors is inelastic only in short-run
- Economic rent depends upon the elasticity of factor supply

- When factor supply is perfectly inelastic, economic rent is zero because transfer earnings equal actual earnings. This type of factor is no rent factor
- When factor supply is perfectly elastic, economic rent equals actual earnings
- When factor supply curve is positively slope, economic rent equals factor price less transfer earnings. In practice, only such type of factor yield economic rent

7.2 Wage

Prof. Benham-*"wages imply payments made in terms of money by employers to employees for the services rendered by them. That part of the national dividend which goes to labour as a factor of production constitutes wages. When we talk of wages we usually mean money wages paid for the services of a person per hour or per day or per week or per month as the case may be"*

Wages refer to return for work measured in terms of money

Types of wages

- Money/Nominal wage

Nominal wage or nominal earnings refer to the amount of the wages measured in terms of money

- Real wage

Real wage refer to the purchasing power of money wages plus allowance

Marginal productivity theory of wages

The marginal productivity theory of wages state that wage are determined by the marginal productivity of labour

The theory is based on following propositions

- Wages are determined by the marginal productivity of labour. In other words, the main basis of paying wages to the laborers is their marginal productivity
- Wages are determined at the point where the value of marginal productivity of labour equals to the marginal cost of labour

The theory is based on following assumptions

- Only one commodity is produced by employing only one variable input. i.e. labour
- The theory measure that the goal of a firm is profit maximization
- Production technology remains constant
- An economy is operating full employment in the long-run
- There is the operation of law of diminishing marginal returns in the productivity of labour
- There is existence of perfect competition in both product and factor markets. There is single variable factor, labour, where market is perfectly competitive

Value of marginal productivity of labour[VMP_L]

[VMP_L]=$\frac{\Delta TP}{\Delta L}$

Marginal cost of labour[MC_L]

[VMP_L]= [MC_L]

Summary of this theory

- The theory states that laborers are rewarded on the basis of their marginal productivities
- Wage rate is determined at the point where [VMP_L]= [MC_L]
- [VMP_L] is the product between [MP_L] and [MR]
- Due to the operation of law of diminishing marginal returns in the productivity of labour, [VMP_L] goes on falling as labour increases. Hence, [VMP_L] curve slopes downwards to the right at given price
- Perfect competition exists in both labour and market. Hence, both price of product and labour to each other firm remain constant
- [MP_L] is the marginal cost of labour. It remain constant at any level of employment of workers
- The [MP_L] curve slopes horizontal straight line

Criticisms of this theory

- Unrealistic assumption
- Short period ignore
- Difficulty in measuring marginal productivity
- Collective bargaining power ignored
- Ignores the supply side
- Unrealistic assumption of full employment
- Ignores the wages differentials

7.3 Interest

Interest is that part of national income which goes to capital as a factor of production

Mill-*"interest is the remuneration for mere abstinence"*

Seligman-*"interest is the return from the land of capital"*

Carver-*"the interest is the income which goes to the owner of capital"*

Keynes-*"the reward for parting with liquidity for a specific period"*

Types of interest

- Gross interest

Gross interest is the amount paid by a borrower to a lender as a return on capital borrowed

- Net interest

Net interest is the payment made purely for the use of capital

Loanable fund theory of interest

According to loanable fund theory of interest states that, interest is the price paid for the use of loanable fund. It assert that the rate of interest is determined by demand for and supply of loanable fund

The theory is based on following propositions

- Interest is reward for the use of loanable fund
- Rate of interest is determined at a point where demand for loanable fund equals supply of loanable fund
- Interest is considered as the component of both monetary and real sectors

The theory is based on following assumption

- The market for loanable funds is a fully integrated market, characterized by perfect mobility of funds throughout the market
- There is existence of perfect competition
- Rate of interest is assumed to be flexible

- There is state of full employment of resources in long-run
- Money plays an active role in the determination of the rate of interest

Determinants of demand for loanable funds

- Investment demand

$\frac{dI}{di}$**<0**

- Consumption demand or dissaving

$\frac{dC}{di}$**<0**

- Hoarding

$\frac{dH}{di}$**<0**

Determinants of supply of loanable funds

- Saving

$\frac{dS}{di}$**<0**

- Dishoarding

$\frac{dDh}{di}$**<0**

- Bank money

$\frac{dBL}{di}$**<0**

- Disinvestment

$\frac{dDI}{di}$<0

Criticism of the theory

- Unrealistic integration of monetary and real factors
- Unrealistic assumption of constant income
- Unrealistic assumption full employment
- Indeterminate theory
- Interest elasticity of factors overemphasize

Liquidity preference theory of interest

The liquidity preference theory of interest states that, interest is the reward for parting liquidity for a specified period of time

The theory is based on following propositions

- Interest is reward for parting with liquidity for a specified period of time
- Rate of interest is determined by the interaction between demand for money equals supply of money
- Interest is the purely monetary phenomenon

Motives of demand for money

- Transaction motive
- Precautionary motive
- Speculative motive

Total demand of money

Liquidity preference schedule

Supply of money

The supply of money is determined and controlled by the government or the monetary authority of the country and is interest inelastic

Determination of rate of interest

Effect on rate of interest with a change in money supply at constant demand for money

Effect on rate of interest with a change in demand for money at constant money supply

Criticism of the theory

- Keynes assumed that the level of income is given, the rate of interest will determine the liquidity preference[demand for money]. But liquidity preference is determined by the level of income[supply of money] and, therefore, it cannot be known unless the income level is known
- Keynes assumed that the rate of interest depends on the demand for investment funds, but it is far from the reality. The cash balances of various persons are significantly influence by their demand for capital with a purpose of investment. The demand for capital being independent upon the marginal productivity of capital, the rate of interest is not determined independently of the marginal efficiency of capital
- This theory is applicable only in short-run because it explains only those factors which are important in the short-run
- This theory is only one-sided theory because it assumes supply of money to be given by the monetary authority. But in real life it depends upon a number of factors which are assumed to be

constant by this theory. Hence, it fails to explain the complex phenomena of interest rate

- According to the critics, interest is not reward for parting with a liquidity but it is the reward paid to the lander for the productivity of capital
- Keynesian theory states that rate of interest can be reduced by increasing the supply of money. But if the liquidity preference of the people also increase in the same proportion, then the rate of interest will remain the same
- Keynes considered to be a purely monetary phenomenon and ignored the real factors, such as, productivity and time preference which are assumed to be more important

Difference between Loanable fund theory and Liquidity preference theory

Loanable fund theory	**Liquidity preference theory**
Interest is a reward for the use of loanable funds	Interest is a reward for parting with liquidity
Interest is a real-cum-monetary phenomenon and the theory of interest is a real-cum-monetary theory of interest	Interest is a purely monetary phenomenon and the theory of interest is monetary theory of interest
Rate of interest is determined by the equality between demand for and supply of loanable funds	Rate of interest is determined by the equality between demand for and supply of money
The demand for loanable funds is the demand for investment, consumption and hoarding. Demand for loanable funds for all three purposes is a negative	The demand for money means the demand for liquidity or demand to hold money in cash for transaction and precautionary motive is a positive function of income and is

function of the rate of interest	interest elastic. While the demand for speculative motive is a negative function of interest
The supply of loanable funds comes from saving, dishoarding, bank money and disinvestment. The supply of loanable funds from all these source is a positive function of the rate of interest	The supply of money is fixed and controlled by the monetary authority and is perfectly interest-inelastic
It regards money as a flow since the supply of money is related to the believed to be interest-elastic	It considers money as a dynamic role as a medium of exchange and a store of value

7.4 Profit

Profit are residual income left after all payment have been made

Hansen-*" Profit are residual income left after all payment have been made. The other factor-land, labour and capital are rewarded with rent, wages and interest respectively. Thus, what is left after the contractual payment is profits for the entrepreneur"*

Elements of gross profit

- Monopoly gains
- Windfall gains or chance profit
- Depreciation or maintenance charge
- Imputed payments or imputed cost
- Reward for risk and uncertainty
- Reward for co-ordination
- Reward for innovation

Accounting profit= total sales receipt-accounting cost

Economic profit= total sales receipt-economic cost

Profit=TR-[accounting cost-implicit cost]

Profit=TR-[accounting cost-[implicit cost + normal return to the entrepreneur]]

Normal rate of return to the entrepreneur=opportunity cost of entrepreneur[normal profit]

Types of implicit cost

- Imputed costs
- Normal profit

Role of economic profits in decision making

- When a firm earns positive economic profit, it is making enough to pay the opportunity cost of all the resources it uses, including the opportunity cost of the investors. The investors are doing better than they would have expected to do in any other investment. Resources flow where they will earn more
- When a firm earns negative economic profit, the investors are not being paid their opportunity cost and they will make investment anywhere
- When economic profit is zero, the firm is earning just to pay all the resources their opportunity cost. Thus, investors are getting as much as they would have expected to get in any other investment. The firm earning zero economic profit will neither drive investors away nor attract additional investors

Dynamic theory of profit

According to Clark, profit arise because of dynamic changes in the society

Five important changes

- Change in the size of population
- Change in the supply of capital
- Change in the production techniques
- Change in the form of business organization
- Change in human want

Criticism of the theory

- According to Prof. Knight, all types of dynamic changes cannot lead to profit. It is only those changes which cannot be foreseen, gives rises to profits
- The theory takes no accounts of fact that business ability like any other factors of production has a supply price
- According to Prof. Taussig, the dynamic theory makes an artificial distinction between profit and the earnings of management

Innovation theory of profit

The main function of entrepreneur is to introduce innovation in production and profit is the reward for introducing innovation

Types of innovations

- First types of innovations are cost reducing innovations which bring about the reduction in the cost of production. Introduction of new machines, new and better technique or method of production,

exploitation of a new sources of raw material, organizing the firm in new and better way

- Second types of innovations are demand increasing innovations which increase the demand for product. Introduction of new product, a new variety or quality of good, a new and better technique of advertisement, discovery of new market are various types of demand increasing innovations

Criticism of the theory

- It ignores risk and uncertainty. The major criticism labeled against Schumpeter's innovation theory of profit is that it falls to take note of risk and uncertainty, which are important sources of profits
- Other function of the entrepreneur ignored. Schumpeter has emphasized on only innovation function of the entrepreneur. But an entrepreneur is supposed to perform other function as well, such as organization co-ordination, risk bearing etc.

7.5 Appendix

Determinants of real wages

- Purchasing power of money
- Additional facilities
- Regularity of employment
- Nature of works
- Subsidiary earnings
- Conditions of work
- Social prestige
- Future prospect

Types of wages differentials

- Dynamic wages differentials
- Static wages differentials

Causes of static wages differentials

- Heterogeneous quality of labour
- Difference in the nature of occupation
- Imperfect knowledge about market
- Difference in the product prices

Causes of wages differentials

- Compensating wages differentials
- Cost of training and education
- Risk in performing jobs
- Hours of leisure
- Cost of living
- Cost of performing the jobs
- Non-compensating wages differentials
- Imperfect knowledge about the market
- Prices of products
- Individual qualities of labour