Semester II

17BAU201	CORE – MANAGERIAL ECONOMICS	L	T	P	C
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Course Outcome

Managerial Economics represents the economic theory, the concept of demand, supply, market equilibrium, production functions and market structure. This paper provides the knowledge of economic concepts which is most important for managerial decisions.

Course Objectives

- Equip the students with the knowledge of pricing under different market conditions
- Develop the students skills in managing capital and profit
- Impart students knowledge in national income analysis

UNIT I

Demand, Supply and Market equilibrium: Individual demand, Market demand - Individual supply - Market supply - Market equilibrium - Elasticities of demand and supply - Price elasticity of demand, income elasticity of demand, cross price elasticity of demand, elasticity of supply; Theory of consumer behavior: cardinal utility theory, ordinal utility theory (indifference curves, budget line, consumer choice, price effect, substitution effect, income effect for normal, inferior and giffen goods) - revealed preference theory.

UNIT II

Producer and optimal production choice: optimizing behavior in short run (Geometry of product curves, law of diminishing marginal productivity, three stages of production), Optimizing behavior in long run (isoquants, isocost line, optimal combination of resources) Costs and scale : Traditional theory of cost (short run and long run, geometry of cost curves, envelope curves) - Modern theory of cost (short run and long run) - Economies of scale - Economies of scope.

UNIT III

Theory of Firm and Market Organization : Perfect Competition (Basic features, short run equilibrium of firm / industry, long run equilibrium of firm / industry, effect of changes in demand, cost and imposition of taxes) - Monopoly (Basic features, short run equilibrium, long run equilibrium, effect of changes in demand, cost and imposition of taxes, comparison with perfect competition, welfare cost of monopoly) - Price discrimination, multiplant monopoly; Monopolistic Competition (Basic features, demand and cost, short run equilibrium, long run equilibrium, excess capacity) - Oligopoly (Cournot's model, kinked demand curve model, dominant price leadership model, prisoner's dilemma)

UNIT IV

Factor Market : Demand for a factor by a firm under marginal productivity theory (Perfect Competition in the product market, monopoly in the product market) - Market Demand for a factor - Supply of labour - Market supply of labour - Factor Market Equilibrium.

UNIT V

National Income Analysis - Theories of Income, Output and Employment - Classical - Keynesian theory - Theory of Trade Cycle-Concept and Causes of Trade Cycle -Measures to Control Trade Cycle - Macro Economic Policy - Monetary and Fiscal - Theories of Inflation- Causes and Control of Inflation.

SUGGESTED READINGS:

TEXT BOOKS

1. Maheshwari, Y. (2012) .*Managerial Economics* (3rd ed.). New Delhi: PHI Learning Pvt., Ltd.

REFERENCES

1. Dominick Salvatore. (2009). *Principles of Micro Economics* (5th ed.). Mumbai: Oxford University Press.
2. Richard, G., & Lipsey, K., Alec Chrystal. (2007). *Economics*. Mumbai: Oxford University Press.
3. Pindyck, Rubinfeld, & Mehta. (2009). *Micro Economics* (7th ed.). New Delhi: Pearson Prentice Hall of India.
4. Sundaram, K.P., & Sundaram, E. (2008). *Business Economics*. New Delhi: Sultan Chand & Sons.

Lesson Plan | 2017 – 20 Batch

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed to be University)
(Established under section 3 of UGC Act 1956)
Coimbatore-641021
Department of Management

Name: **Dr. V. KRISHNAVENI (Assistant Professor)**
Department: **Management**
Subject Code: 1**7BAU201** Semester: **II** Year: **2017-20 Batch**
Subject: **Managerial Economics - Lesson Plan**

UNIT – I			
SL. No.	**Lecture Duration Hours**	**Topics to be Covered**	**Support Material**
1	I	Demand – Meaning and Definition Demand and Utility, Types of utility	R2: Page No: 40-42 W 1:
2	I	Law of demand with example	R2: Page No: 42-46
3	I	Factors determining the law of demand	R2: Page No: 47-51
4	I	Elasticity of demand-Price elasticity , Factors influencing price elasticity of demand	R1: Page No: 119-138 R3: Page No : 1.79 - 1.85
5	I	**Tutorial :** Income elasticity of demand	R1: Page No: 139-143
6	I	Cross elasticity of demand, Factors Influencing the Income and Cross Elasticity	W 2:
7	I	Demand forecasting – Concepts and Features of forecasting	R2: Page No: 159-163 R1: Page No: 233-236
8	I	Methods of demand forecasting	R2: Page No: 164-169
9	I	Supply : meaning, determinants of supply	R1: Page No: 316-320
10	I	**Tutorial :** Law of supply	R1: Page No: 321-323
11	I	Elasticity of supply in Long-run and Short –run of Industry	R1: Page No: 324-326
12	I	Market equilibrium	R1: Page No: 402-404
13	I	Changes in market equilibrium – To be Explained with diagram	R1: Page No: 406-410
14	I	Theory of Consumer behavior	T : Page No: 81 – 85
15	I	**Tutorial :** Cordinal Utility Theory	T : Page No: 43 – 48
16	I	Ordinal Utility Theory	T : Page No: 49 – 52
17	I	Indifference Curves	T : Page No: 53 – 58
18	I	Budget Line	R3 : Page No: 173 –180

19	I	Consumer choice	T : Page No: 81 – 85
20	I	**Tutorial :** Price effect	R3 : Page No: 188 –193
21	I	Substitution effect	R3 : Page No: 185 –187
22	I	Income effect for normal, inferior and giffen goods	T : Page No: 53 – 58 : W3 :
23	I	Revealed Preference Theory	T : Page No: 59 – 63
24	I	Recapitulation and discussion of important questions	-
Total no. of hours planned for unit - I			**24**
UNIT – II			
SL. No.	**Lecture Duration Hours**	**Topics to be Covered**	**Support Material**
1	I	Producer and Optimal Production Choice	T : Page No: 95 – 114
2	I	Optimizing behavior in short run	R2: Page No: 173-175
3	I	Geometry of product curves	R2: Page No: 200-205
4	I	Law of diminishing marginal productivity	R2: Page No: 206-210
5	I	**Tutorial :** Law of diminishing marginal productivity	R2 : Page No: 211-215 R1 : Page No: 415 - 422
6	I	Three stages of production	R3: Page No: 123-130
7	I	Optimizing behavior in long run	R3: Page No: 139-140, W 4
8	I	Iso-quant curves – significance	T : Page No: 104 – 110
9	I	General properties of Iso-quant Curves	R2: Page No: 200-205
10	I	**Tutorial :** Production in Long run and Short run	R2: Page No: 206-210
11	I	Iso-cost Line and its importance	R2 : Page No: 211-215 R1 : Page No: 415 - 422
12	I	Optimal combination of resources	R3: Page No: 123-130 W 5:
13	I	Cost and Scale	T : Page No: 115 – 131
14	I	Traditional Theory of cost	T : Page No: 119 – 120
15	I	**Tutorial :** TTC – Short run and Long run	T : Page No: 121 – 125
16	I	Geometry of cost curves	T : Page No: 126– 127
17	I	Envelop Curves	T : Page No: 128 – 131
18	I	Modern Theory of cost	T : Page No: 131 – 133
19	I	Short run and Long run	T : Page No: 134 – 137
20	I	**Tutorial :** Cost output relationship in short run	W6 :

21	I	Cost output relationship in Long run	T : Page No: 124 – 125
22	I	Economies of scale	T : Page No: 125 – 127
23	I	Economies of scope	T : Page No: 127 – 128
24	I	Recapitulation and discussion of important questions	-
Total no. of hours planned for unit - II			**24**
UNIT - III			
SL. No.	**Lecture Duration Hours**	**Topics to be Covered**	**Support Material**
1	I	Market –Definition and Importance, classification of market	R2: Page No: 293-296
2	I	Perfect competition – Basic Features	T : Page No. 135 – 138 R3: Page No: 4.47 - 4.53
3	I	Short run equilibrium of firm / industry	R3: Page No: 4.47 - 4.53
4	I	Long run equilibrium of firm / industry	R1: Page No: 424 - 427
5	I	**Tutorial :** Effect of changes in demand, cost and imposition of taxes	R1: Page No: 427 - 430
6	I	Monopoly – Features of Monopoly, Pricing under Monopoly	R3: Page No: 4.61-4.65
7	I	Short run equilibrium	R3: Page No: 4.61 - 4.63
8	I	Long run equilibrium	R3: Page No: 4.64- 4.65
9	I	Effect of changes in demand, cost and imposition of taxes	R1: Page No: 434 - 437
10	I	**Tutorial :** Comparison with perfect competition, welfare cost of monopoly	R1: Page No: 438 - 440
11	I	Price discrimination and its concepts	R1: Page No: 441 - 445
12	I	Price discrimination – multiplant monopoly	R1: Page No: 446 - 451
13	I	Price discrimination under dumping	R1: Page No: 452-453
14	I	Monopolistic competition – Assumptions, Features, Price discrimination and Concepts	R1: Page No: 454-457 W 7 :
15	I	**Tutorial :** Monopolistic competition – demand and cost	R1: Page No: 454-457
16	I	Short run equilibrium	R1: Page No: 457 - 459
17	I	Long run equilibrium	R1: Page No: 457 - 459
18	I	Excess capacity	R1: Page No: 460 - 465
19	I	Pricing under oligopoly - Kinked demand curve model	R1: Page No: 470-476, W 8 :
20	I	**Tutorial :** Duopoly – Meaning, Definition and Characteristics of duopoly – Cournot's model	R1: Page No: 476-478
21	I	Monopsony – Meaning and Characteristics	R2: Page No: 305-308

22	I	Dominant Price Leadership Model	R2: Page No: 308 - 311
23	I	Prisoner's Dilemma	R2: Page No: 312 - 313
24	I	Recapitulation and discussion of important questions	-
Total no. of hours planned for unit - III			**24**
UNIT – IV			
SL. No.	**Lecture Duration Hours**	**Topics to be Covered**	**Support Material**
1	I	Factor Market – Introduction	R3: Page No: 398 – 415
2	I	Concepts of Factor Demand	W 9 :
3	I	Determinants of Resource Demand	R3: Page No:401 – 404
4	I	Factor Market – Characteristics	R3: Page No: 405 – 409
5	I	**Tutorial :** Resource Demand, and Resource Supply	R3: Page No: 410 – 415
6	I	Monopolist Factor demand	W 9 :
7	I	Marginal Productivity Theory	R3: Page No: 416 – 434
8	I	Demand for a factor by a firm under marginal productivity theory	R3: Page No: 416 – 420
9	I	Perfect competition in the product market	R3: Page No: 421 – 423
10	I	**Tutorial :** Equilibrium Price in Perfect Market	R3: Page No: 424 – 426
11	I	Equilibrium Price in Perfect Market - Industry	W 10 :
12	I	Equilibrium of the firm under perfect	R3: Page No: 427 – 429
13	I	Monopoly in the product market	R3: Page No: 430 – 434
14	I	Equilibrium under monopoly	R3: Page No: 430 – 432
15	I	**Tutorial :** Equilibrium of the Industry	R3: Page No: 433 – 434
16	I	Market Demand	R3: Page No: 416 – 417
17	I	Market Demand for a factor	W 10 :
18	I	Supply of Labour – Neo Classical View	R3: Page No: 424 – 426
19	I	Supply of Labour – Marxist View	R3: Page No: 424 – 426
20	I	**Tutorial :** Market supply of labour	R3: Page No: 427 – 428
21	I	Key Factors affecting Market supply of labour	R3: Page No: 427 – 428
22	I	Factor Market Equilibrium – Meaning	W 10 :
23	I	Competitive Factor Market	W 10 :
24	I	Recapitulation and discussion of important questions	-
Total no. of hours planned for unit - IV			**24**
UNIT – V			

Lesson Plan | 2017 – 20 Batch

SL. No.	Lecture Duration Hours	Topics to be Covered	Support Material
1	I	National income – Meaning and Concepts of national income	R3: Page No: 280-292
2	I	Methods of national income Gross National Product, Net National Product	R3: Page No: 292-297
3	I	Methods of national income - Net Normal Product at Factor Cost, Relation between NNP @ Market Price	R3: Page No: 292-297
4	I	Factors determining national income	R1: Page No: 608-609
5	I	**Tutorial :** Theories of national income	R1: Page No: 610-613
6	I	Theories of Income, Output and Employment	R1: Page No: 608-609
7	I	Classical Theories	R1: Page No: 610-613
8	I	Keynesian Theory	R1: Page No: 608-609
9	I	Theory of Trade Cycle – Significance	R1: Page No: 616-617
10	I	**Tutorial :** Concept and Causes of Trade Cycle	T : Page No: 211-214
11	I	Measures to Control Trade Cycle	T : Page No: 211-214
12	I	Trade cycle – Phases of trade cycle	R1: Page No: 614-615
13	I	Macro Economic Policy – Concept Output and Income	R1: Page No: 614-615
14	I	Macro Economic Policy – Unemployment	R1: Page No: 614-615
15	I	**Tutorial :** Monetary Policies	R1: Page No: 619-620
16	I	Fiscal policies	T : Page No: 229-235
17	I	Theories of inflation	T : Page No: 240-251
18	I	Theories of inflation - Significance, Quantity Theory of Money	R1: Page No: 621 – 625,
19	I	Causes of Inflation	W 11:
20	I	**Tutorial :** Control of inflation	W 11:
21	I	Recapitulation and discussion of important questions	-
	Total no. of hours planned for unit - V		**21**
22	I	Discussion of previous ESE question papers	-
23	I	Discussion of previous ESE question papers	-
24	I	Discussion of previous ESE question papers	3
Total no. of hours planned for unit – V and Discussion of previous year question papers			**24**

SUGGESTED READINGS:

TEXT BOOK :

1. T: Maheswari. Y, Managerial Economics, PHI Learning Pvt., Ltd, New Delhi, 3rd Edition, 2013.

REFERECE BOOKS :

1. R1 : Sankaran . S, Business Economics, Margham Publications, 9th Edition, 2013.
2. R2: H.L Ahuja, Business Economics , Sultan chand & sons, NewDelhi, 11th Edition, 2012.
3. R3 : Sundaram. K.P & Sundaram . E, Business Economics, Sultan chand & sons, NewDelhi,10th Edition, 2013.

WEBSITES :

1. W1: https://en.wikipedia.org/wiki/Demand
2. W2: https://www.investopedia.com/terms/d/demand.asp
3. W3: www.businessdictionary.com/definition/supply.html
4. W4: https://en.wikipedia.org/wiki/Production_function
5. W5: https://en.wikipedia.org/wiki/Isoquant
6. W6: https://www.youtube.com/watch?v=qYKJdooEnwU
7. W7: https://www.khanacademy.org/.../perfect-competition
8. W8: https://en.wikipedia.org/wiki/Monopoly
9. W 9: https://en.wikipedia.org/wiki/Factor_market
10. W 10:https://www.higherrockeducation.org/glossary-of-terms/factor-market
11. W 11: https://en.wikipedia.org/wiki/nationalincome

Unit – I : Demand, Supply And Market Equilibrium: Individual demand, Market demand – Individual supply – Market supply –Market equilibrium – Elasticities of demand and supply – Price elasticity of demand, income elasticity of demand, cross price elasticity of demand, elasticity of supply ; Theory of consumer behavior : Cardinal Utility theory, Ordinal utility theory (indifference curves, budget line, consumer choice, price effect, substitution effect, income effect for normal, inferior and giffen goods) – revealed preference theory

Desire for an object is called the demand function. This lesson examines demand and its determinants. Demand is the force that drives all business without a demand for its goods or services, a firm is doomed to failure.

MEANING OF DEMAND

In economic science, the term "demand" refers to the desire, backed by the necessary ability to pay. The demand for a good at a given price is the quantity of it that can be bought per unit of time at the price. There are three important things about the demand: 1. It is the quantity desired at a given price. 2. It is the demand at a price during

a given time. 3. It is the quantity demanded per unit of time.

DETERMINANTS OF DEMAND

The factors that determine the size and amount of demand are manifold. The term "function" is employed to show such "determined" and "determinant" relationship. For instance, we say that the quantity of a good demanded is a function of its price

i.e., $Q = f(p)$

Where Q represents quantity demanded

f means function, and

p represents price of the good.

There are many **important determinants** of the demand for a commodity:

1. **Price of the goods** :

The first and foremost determinant of the demand for good is price. Usually, higher the price of goods, lesser will be the quantity demanded of them.

2. **Income of the buyer:**

The size of income of the buyers also influences the demand for a commodity. Mostly it is true that "larger the income, more will be the quantity demanded".

3. **Prices of Related Goods**:

The prices of related goods also affect the demand for a good. In some cases, the demand for a good will go up as the price of related good rises. The goods so inter-related arc known as substitutes, e.g. radio and gramophone. In some other cases, demand for a good will comes down as the price of related good rises. The goods so inter-related are complements, e.g. car and petrol, pen and ink, cart and horse, etc.

4. **Tastes of the buyer:**

This is a subjective factor. A commodity may not be purchased by the consumer even though it is very cheap and useful, if the commodity is not up to his taste or liking. Contrarily, a good may be purchased by the buyer, even though it is very costly, if it is very much liked by him.

5. **Seasons prevailing at the time of purchase;**

In winter, the demand for woolen clothes will rise; in summer, the demand for cool drinks rises substantially; in the rainy season, the demand for umbrellas goes up.

6. **Fashion:**

When a new film becomes a success, the type of garments worn by the hero or the heroine or both becomes an article of fashion and the demand goes up for such garments.

7. **Advertisement and Sales promotion:**

Advertisement in newspapers and magazines, on outdoor hoardings on buses and trains and in radio and television broadcasts, etc. have a substantial effect on the demand for

the good and thereby improves sales. The need to have clarity in demand analysis makes us adopt a 'ceteris paribus' assumption, i.e. all other things remain the same except one. This enables us to consider the relation between demand and each of the variable factors considered in isolation.

Law Of Demand

For a long period of time economists are much interested to study the relationship of price and sales. An indepth knowledge of such relationship is necessary for the management.

Among the many causal factors affecting demand, price is the most significant and the price- quantity relationship called as the Law of Demand is stated as follows: "The greater the amount to be sold, the smaller must be the price at which it is offered in order that it may find purchasers, or in other words, the amount demanded increases with a fall in price and diminishes with a rise in price" (Alfred Marshall). In simple words the things being equal, quantity demanded will be more at a lower price than at higher price.

The law assumes that income, taste, fashion, prices of related goods, etc. remain the same in a given period. The law indicates the inverse relation between the price of a commodity and its quantity demanded in the market. However, it should be remembered that the law is only an indicative and not a quantitative statement. This means that it is not necessary that such variation in demand be proportionate to the change in price.

Demand Schedule

It is a list of alternative hypothetical prices and the quantities demanded of a good corresponding to these prices. It refers to the series of quantities an individual is ready to buy at different prices. An imaginary demand schedule of an individual for apples is given below:

Demand of a Consumer apple

Price of Apple per unit (in rupees)	Quantity demanded of Apples (in Dozens)
4	2
3	3
2	4
1	5

Assuming the individual to be rational in his purchasing behaviour, the above schedule illustrates the law of demand. At Rs.5/- per apple, the consumer demands 1 dozen of apples; at Rs.4/- per unit 2

dozens, at Rs.3/- per unit 3 dozens and at Rs.2/~ per unit 4 dozens. Thus the inverse relationship between price and demand is shown in the demand schedule.

Demand Curve

When the data presented in the demand schedule can be plotted on a graph with quantities demanded on the horizontal or X- axis and hypothetical prices on the vertical or Y- axis, and a smooth curve is hypothetical prices on the vertical or Y- axis, and a smooth curve is drawn Joining all the points so plotted, it gives a demand curve. Thus, the demand schedule is translated into a diagram known as the demand curve.

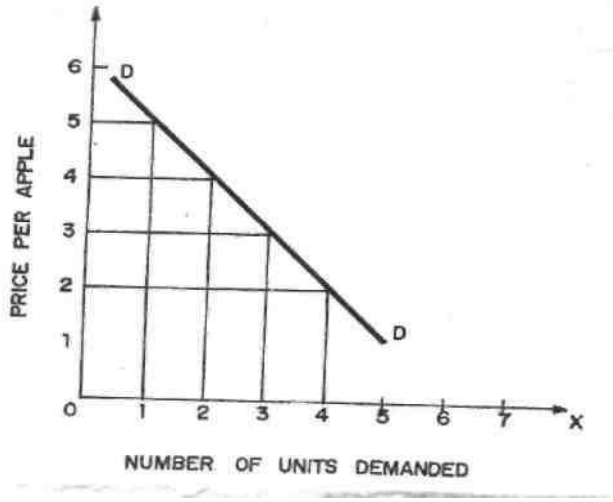


Fig -1

The demand curve slopes downwards from left to right, showing the inverse relationship between price and quantity as in Figure 1.

Market Demand

The market demand reflects the total quantity purchased by all consumers at alternative hypothetical prices. It is the sum- total of all individual demands. It is derived by adding the quantities demanded by each consumer for the product in the market at a particular price. The table presenting the series of quantities demanded of all consumers for a product in the market at alternative hypothetical prices is known as the Market Demand Schedule. If the data are represented on a two dimensional graph, the resulting curve will be the Market Demand Curve. From the point of view of the seller of the product, the market demand curve shows the various quantities that he can sell at different prices. Since the demand curve of an individual is downward sloping, the lateral addition of such curves to get market demand curve will also result in downward sloping curve.

Shifts in Demand Curve

The price-quantity relationship represented by the law of demand is important but it is more important for the manager of the firm to know about the shifts in the demand function (or curve). For many products, change in price has little effect in the quantity demanded in relevant price ranges. Many other determinants like incomes, tastes, fashion, and business activity have larger effect on demand for such product. Thus, changes or shifts in demand curve rather than movement along the demand curve is of greater significance to the decision-maker in the firm.

Let us clearly know the difference between movement along one and the same demand curve and shift in demand curve due to changes

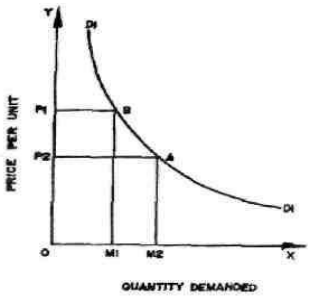
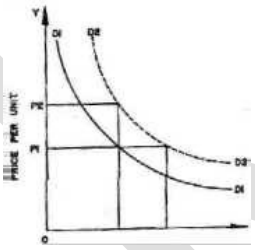


Fig- 2a

in demand. When price of a good alone varies, ceteris paribus, the quantity demanded of the good changes. These changes due to price variations alone are called as extension or contraction of demand represented by movement along the same demand curve. Such movement along the same demand curve is shown in Figure 2(a). Price declines from OP1 to OP2 and demand goes up from OM1 to OM2. Here the demand for the good is said to have extended or expanded. This is represented by movement from point A to point B along the demand curve. On the contrary, if price rises from OP2 to OP1 demand falls from OM2 to OM1. Here the demand for the good is said to have contracted. This is represented by movement from point B to point A along the demand curve D1D1.



Quantity Demanded

Fig. 2b

Shifts in demand curve take place on account of determinants other than price such as changes in income, fashion, tastes, etc. The ceteris paribus assumption is relaxed; other factors than price influence demand and the impact of these factors on demand

is described as changes in demand or shifts in demand, showing increase or decrease in demand. This kind of change is shown in Figure 2(b). The quantity demanded at OP1 is OM1. If, as a result of increase in income, more of the product is demanded, say OM2 at

the same price OP1. Note that OM2 is due to the new demand curve D2D2. This is a case of shift in demand. Due to fall in income, less of the good may be demanded at the same price and this will be a case of decrease in demand. Thus increase or decrease in demand with shifts in demand curves upward or downward are different from extension or

contraction of demand.

Causes of changes in demand may be due to:

1. Changes in the consumer's income.
2. Changes in the tastes of the consumer.
3. Changes in the prices of related goods (substitutes and complements).
4. Changes in exogenous factors like fashion, social structure, etc.

Why The Demand Curve Slopes Downward Or Reasons For The Law Of Demand

Truly, the demand curve slopes left downward to right, throughout its length although the slope may be much steeper in some parts. It means, demand increases with the fall in price and contracts with an increase in price. There are several reasons responsible for the inverse price demand relationship which has been explained as under:

1. Law of Diminishing Marginal Utility.

The law of demand is based on the law of diminishing marginal utility which states that as the consumer purchases more and more units of a commodity, the utility derived from each successive unit goes on decreasing. It means as the price of the commodity falls, consumer purchases more of the commodity so that his marginal utility from the commodity falls to be equal to the reduced price and vice-versa.

2. **Substitution Effect**.

Substitution effect also leads the demand curve to slope from left downward to right. As the price of a commodity falls, prices of its substitute goods remain the same, the consumer will buy more of that commodity. For instance, tea and coffee are the substitute goods. If the price of tea goes down, the consumers may substitute tea for coffee, although price of coffee remains the same. Therefore, with a fall in price, the demand will increase due to favourable substitution effect. On the other hand with the rise in price, the demand falls due to unfavourable substitution effect. This is nothing but the application of Law of Demand.

3. Income Effect.

Another reason for the downward slope of demand curve is the income effect. As the price of the commodity falls, the real income of the consumer goes up. Real income is that income which is measured in terms of goods and services. For example, a consumer has Rs.20, he wants to buy oranges whose price is Rs.20 per dozen. It means the consumer can buy one dozen of oranges with his fixed income. Now, suppose, the price of the oranges falls to Rs.15 per dozen which leads to an increase in his real income by Rs.5. In this case, either the consumer will buy more quantity of oranges than before or he will buy some other commodity with his increased income.

4. **New Consumers**.

When the price of commodity falls, many other consumers who were not consuming that commodity previously will start consuming the commodity. As a result, total market demand goes up. For example, if the price of radio set falls, even the poor man can buy the radio set. Consequently, the total demand for radios goes up.

5. Several Uses.

Some commodities can be put to several uses which lead to downward slope of the demand curve. When the price of such commodities goes up they will be used for important purposes, so their demand will be limited. On the other hand, when the price

falls, the commodity in question will extend its demand. For instance, when the price of coal increases, it will be used for important purposes but as the price falls its demand will increase and it will be used for many other uses.

6. Psychological Effects.

When the price of a commodity falls, people favour to buy more which is natural and psychological. Therefore, the demand increases with the fall in prices. For example, when the price of silk falls, it is purchased for all the members of the family.

EXCEPTIONS TO THE LAW OF DEMAND

The Law of Demand will not hold good in certain peculiar cases in which more will be demanded at a higher price and less at a lower price. In these cases the demand curves will be exceptionally different, differing from the usual downward sloping shape of the demand curve. The exceptions are as follows:

(i) Conspicuous goods: Some consumers measure the utility of a commodity by its price i.e., if the commodity is expensive they think that it has got more utility. As such, they buy less of this commodity at low price and more of it at high price. Diamonds are often given as example of this case. Higher the price of diamonds, higher is the prestige value attached to them and hence higher is the demand for them.

ii) Giffen goods: Sir Robert Giffen, an economist, was surprised to find out that as the price of bread increased, the British workers purchased more bread and not less of it. This was something against the law of demand. Why did this happen? The reason given for this is that when the price of bread went up, it caused such a large decline in the purchasing power of the poor people that they were forced to cut down the consumption of meat and other more expensive foods.

Since bread even when its price was higher than before was still the cheapest food article, people consumed more of it and not less when its price went up. Such goods

which exhibit direct price-demand relationship are called 'Giffen goods'. Generally those goods which are considered inferior by the consumers and which occupy a substantial place in consumer's budget are called 'Giffen goods'. Examples of such goods are coarse grains like bajra, low quality of rice and wheat etc.

(iii) Future expectations about prices: It has been observed that when the prices are rising, households expecting that the prices in the future will be still higher tend to buy larger quantities of the commodities. For example, when there is wide-spread drought, people expect that prices of food grains would rise in future. They demand greater quantities of food grains as their price rise. But it is to be noted that here it is not the law of demand which is invalidated but there is a change in one of the factors which was held constant while deriving the law of demand, namely change in the price expectations of the people.

(iv) The law has been derived assuming consumers to be rational and knowledgeable about market-conditions. However, at times consumers tend to be irrational and make impulsive purchases without any cool calculations about price and usefulness of the product and in such contexts the law of demand fails.

(v) Similarly, in practice, a household may demand larger quantity of a commodity even at a higher price because it may be ignorant of the ruling price of the commodity. Under such circumstances, the law will not remain valid. The law of demand will also fail if there is any significant change in other factors on which demand of a commodity depends. If there is a change in income of the household, or in prices of the related commodities or in tastes and fashion etc. the inverse demand and price relation may not hold good.

TYPES OF DEMAND

There are three types of demand. They are

1. Price Demand
2. Income Demand and

3. Cross Demand which are explained below:

1. Price Demand

It refers to the various quantities of the good which consumers will purchase at a given time and at certain hypothetical prices assuming that other conditions remain the same. We are generally concerned with price demand only. In the explanation of the law of demand given above, we dealt in detail with price demand only.

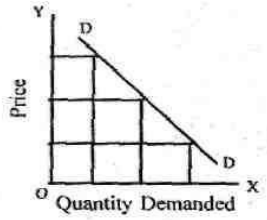


Fig - 3

Income demand: Income demand refers to the various quantities of a commodity that a consumer would buy at a given time at various levels of income. Generally, when the income increases, demand increases and vice versa.

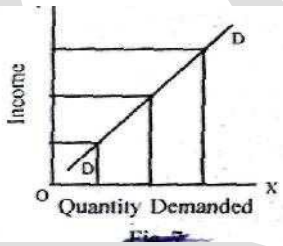
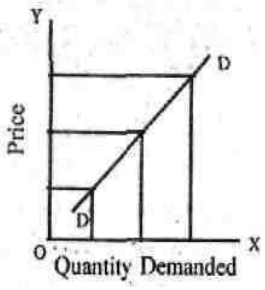


Fig - 4

Cross Demand: When the demand of one commodity is related with the price of other commodity is called cross demand. The commodity may be substitute or complementary. Substitute goods are those goods which can be used in case of each other. For example, tea and coffee, Coca-cola and Pepsi. In such case demand and price are positively related. This means if the price of one increased then the demand for other also increases and vise

versa. Complementary goods are those goods which are jointly used to satisfy a want. In other words, complementary goods are those which are incomplete without each other. These are things that go together, often used simultaneously. For example, pen and ink.



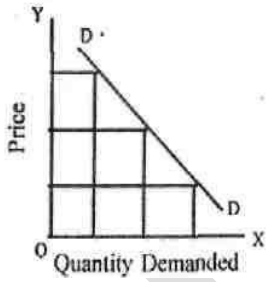
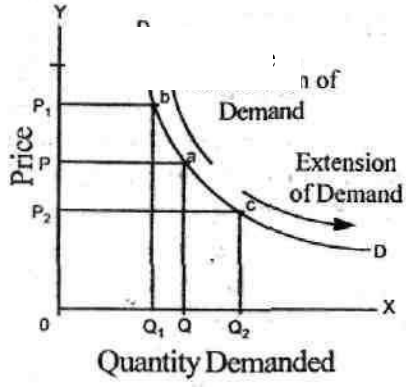


Fig – 5a **Fig – 5b**

Tennis rackets and tennis balls, cameras and film, etc. In such goods the price and demand are negatively related. This means when the price of one commodity increases the demand for the other falls.

Extension and Contraction of Demand

The change in demand due to change in price only (when other factors remain constant) is called extension and contraction of demand. Increase in demand due to fall in price is called extension of demand. Decrease in demand due to rise in price is called contraction of demand. Extension and Contraction of demand results in movement on the same demand curve. It is shown in the following diagram.

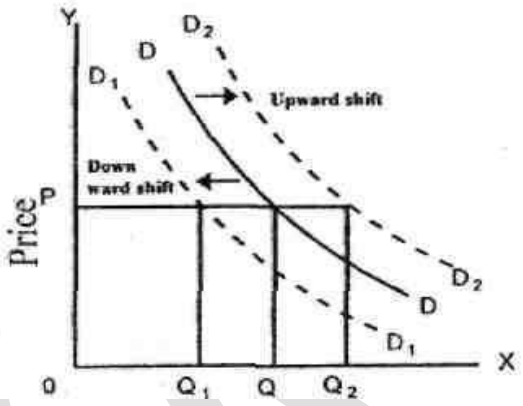


When pri om OP_2 to $0P_2$ demand will be increased to OQ_2 t along the demand curve DD from a to c. This indica e price rises to OP_1, the demand will be decreased vement along the demand curve from a to b. This i

Shift in Demand

We have see ly on price but also on other factors like income, population, taste and preference of consumers etc. The change in demand due to change in any of the factors other than the price is called shift in

demand. Change in any one of the factors shifts the entire demand curve. A change in demand will shift the demand curve either upwards or downwards. An upward shift in demand curve is called increase in demand. Downward shift in demand curve is called decrease in demand. Shift in demand is shown in the following diagram.



Quantity Demand

Fig - 7

In the given figure DD is the original demand curve. When the demand increases, (e.g., due to increase in income) the curve will shift upwards to D2D2 without any increase in price. It is constant at OP. Similarly when the demand decreases, (e.g., due to decrease in income) the curve will shift downwards to D1D1. The price remains constant. Thus extension of demand is different from increase in demand. Likewise, contraction of demand doesn't mean decrease in demand. It should be noted that exclusion and contraction of demand is called "change in quantity demanded" and shift in demand is called "change in demand".

Other Types of Demand

Joint demand: When several commodities are demanded for a joint purpose or to satisfy a particular want. It is a case of a joint demand. Milk , sugar and tea dust are jointly

demanded to make tea. Similarly, we may demand paper, pen and ink for writing. Demand for such commodities in bunch is known as joint demand. Demand for land, labour, capital and organisation for producing commodity is also a case of joint demand.

Composite demand: The demand for a commodity which can be put to several uses is a composite demand. In this case a single product is wanted for a number of uses. For example, electricity is used for lighting, heating, for running the engine, for the fans etc. Similarly coal is used in industries, for cooking etc.

Direct and Derived demand: The demand for a commodity which is for direct consumption, i.e.. Demand for ultimate object, is called direct demand, e.g food, cloth, etc. Direct demand is called autonomous demand. Here the demand is not linked with the purchase of some main products. When the commodity is demanded as a result of the demand for another commodity or service, it is known as the derived demand or induced demand. For example, demand for cement is derived from the demand for building construction; demand for tires is derived from the demand for cars or scooters, etc.

Importance of the Law of Demand

The law of demand plays a crucial role in decision-making and forward planning of a business unit. The production planning in a firm mainly rests on accurate demand analysis. The law of demand has theoretical as well as practical advantages. These are as follows:

1. Price determination: With the help of law of demand a monopolist fixes the price of his product. He is able to decide the most profitable quantity of output for him.

2. Useful to government: The finance minister takes the help of this law to know the effects of his tax reforms and policies. Only those commodities which have relatively inelastic demand should be taxed.

3. Useful to farmers: From the law of demand, the farmer knows how far a good or bad crop will affect the economic condition of the fanner. If there is a good crop and demand for it remains the same, price will definitely go down. The farmer will not have much

benefit from a good crop, but the rest of the society will be benefited.

4. In the field of planning: The demand schedule has great importance in planning for individual commodities and industries. In such cases it is necessary to know whether a given change in the price of the commodity will have the desired effect on the demand for commodity within the country or abroad. This is known from a study of the nature of demand schedule for the commodity.

INDIFFERENCE CURVE ANALYSIS

In the last section we discussed marginal utility analysis of demand. A very popular alternative and more realistic method of explaining consumer's demand is the Indifference Curve Analysis. This approach to consumer behaviour is based on consumer preferences. It believes that human satisfaction being a psychological phenomenon cannot be measured quantitatively in monetary terms as was attempted in Marshall's utility analysis. In this approach it is felt that it is much easier and scientifically more sound to order preferences than to measure them in terms of money. The consumer preference approach, is, therefore an ordinal concept based on ordering of preferences compared with Marshall's approach of cardinality.

Assumptions Underlying Indifference Curve Approach

1. The consumer is rational and possesses full information about all the relevant aspects of

economic environment in which he lives.

2. The consumer is capable of ranking all conceivable combinations of goods according

to the satisfaction they yield. Thus if he is given various combinations say A, B, C, D, E he can rank them as first preference, second preference and so on.

3. If a consumer happens to prefer A to B, he can not tell quantitatively how much he prefers A

to B.

4. If the consumer prefers combination A to B, and B to C, then he must prefer combination

A to C. In other words, he has consistent consumption pattern behaviour.

5. If combination A has more commodities than combination B, then A must be preferred to

B.

What are Indifference Curves?

Ordinal analysis of demand (here we will discuss the one given by Hicks and Allen) is based on indifference curves. An indifference curve is a curve which represents all those combinations of goods which give same satisfaction to the consumer. Since all the combinations on an indifference curve give equal satisfaction to the consumer, the consumer is indifferent among them. In other words, since all the combinations provide same level of satisfaction the consumer prefers them equally and does not mind which combination he gets.

To understand indifference curves let us consider the example of a consumer who has one unit of food and 12 units of clothing. Now we ask the consumer how many units of clothing he is prepared to give up to get an additional unit of food, so that his level of satisfaction does not change. Suppose the consumer says that he is ready to give up 6 units of clothing to get an additional unit of food. We will have then two combinations of food and clothing giving equal satisfaction to consumer: Combination A has 1 unit of food and 12 units of clothing, combination B has 2 units of food and 6 units of clothing.

Similarly, by asking the consumer further how much of clothing he will be prepared to forgo for successive increments in his stock of food so that his level of satisfaction remains unaltered, we get various combinations as given below:

Table Indifference Schedule

Combination	Food	Clothing	MRS
A	1	12	

B	2	6	6
C	3	4	2
D	4	3	1

Now if we draw the above schedule we will get the following figure. In Figure 8, an indifference curve IC is drawn by plotting the various combinations of the indifference schedule. The quantity of food is measured on the X axis and the quantity of clothing on the Y axis. As in indifference schedule, combinations lying on an indifference curve will give the consumer same level of satisfaction.

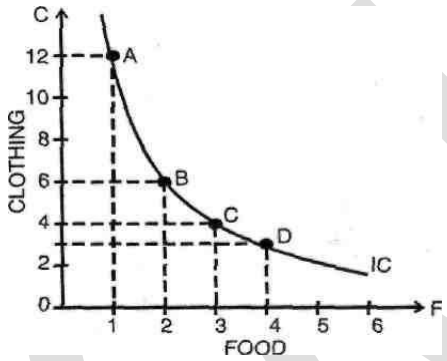


Fig. 8 : A Consumer's Indifference Curve

Indifference Map:

A set of indifference curves is called indifference map. An indifference map depicts complete picture of consumer's tastes and preferences. An indifference map of a consumer is shown which consists of three indifference curves.

We have taken good X on X-axis and good Y on Y-axis. It should be noted that while the consumer is indifferent among the combinations lying on the same indifference curve, he certainly prefers the combinations on the higher indifference curve to the combinations lying on a lower indifference curve because a higher indifference curve signifies a higher level of .satisfaction. Thus while all combinations of IC, give same satisfaction, all combinations lying on IC2 give

greater satisfaction than those lying on IC1

Marginal Rate of Substitution: Marginal Rate of Substitution (MRS) is the rate at which the consumer is prepared to exchange goods X and Y Consider Table-2. In the beginning the consumer is consuming 1 unit of food and 12 units of clothing. Subsequently, he gives up 6 units of clothing to get an extra unit of food, his level of satisfaction remaining the same. The MRS here is 6. Like wise which he moves from B to and from C to D in his indifference schedule, the MRS are 2 and 1 respectively. Thus, we can define MRS of X for Y as the amount of Y whose loss can just be compensated by a unit gain of X in such a manner that the level of satisfaction remains the same. We notice that MRS is falling i.e., as the consumer has more and more units of food, he is prepared to give up less and less units of cloths. There are two reasons for this.

1. The want for a particular good is satiable so that when a consumer has its more quantity, his intensity of want for it decreases. Thus, when consumer in our example, has more units of food, his intensity of desire for additional units of food decreases.
2. Most of the goods are imperfect substitutes of one another. If, they could substitute one another perfectly. MRS would remain constant.

Properties of Indifference Curves:

The following are the main characteristics or properties of indifference curves :

(i) Indifference curves slope downward to the right:

This property implies that when the amount of one good in combination is increased, the amount of the other good is reduced. This is essential if the level of satisfaction is to remain the same on an indifference curve.

(ii) Indifference curves are always convex to the origin:

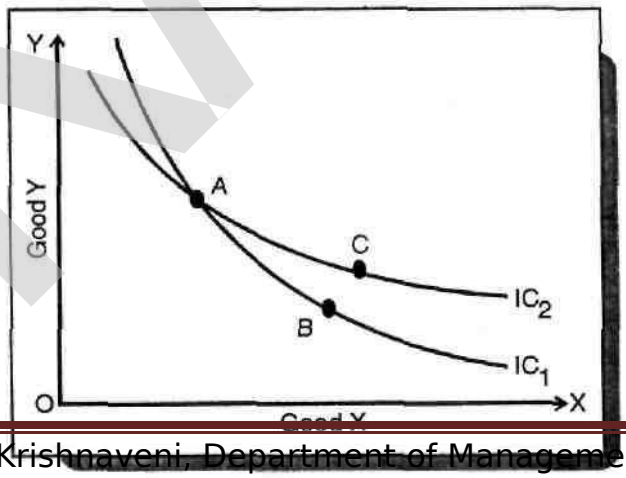
It has been observed that as more and more of one commodity (X) is substituted for another (Y), the consumer is willing to part with less and less of the commodity being substituted (i.e. Y). This is called diminishing marginal rate of

substitution. Thus in our example of food and clothing, as a consumer has more and more units of food, he is prepared to forego less and less units of clothing. This happens mainly because want for a particular good is satiable and as a person has more and more of a good, his intensity of want for that good goes on diminishing.

This diminishing marginal rate of substitution gives convex shape to the indifference curves. However, there are two extreme situations. When two goods are perfect substitutes of each other, the indifference curve is a straight line on which MRS is constant. And when two goods are perfect complementary goods (e.g. gasoline and water in a car), the indifference curve will consist of two straight line with a right angle bent which is convex to the origin or in other words, it will be L shaped.

(iii) Indifference curves can never intersect each other:

No two indifference curves will intersect each other although it is not necessary that they are parallel to each other. In case of intersection the relationship becomes logically absurd because it would show that higher and lower levels are equal which is not possible. This property will be clear from the following Figure 10.



Intersecting Indifference Curves

Fig. 10

In figure 10 IC_1, and IC_2 intersect at A. Since A and B lie on IC_1, they give same satisfaction to the consumer. Similarly since A and C lie on IC_2, they give same satisfaction to the consumer. This implies that combination B and C are equal in terms of satisfaction. But a glance will show that this is an absurd conclusion because certainly combination C is better than combination B because it contains more units of commodities X and Y. Thus we see that no two indifference curves can touch or cut each other.

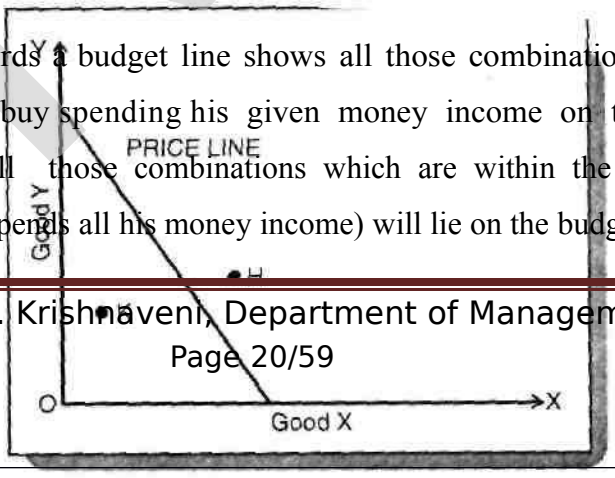
(i) A higher indifference curve represents a higher level of satisfaction than the lower indifference curve:

This is because combinations lying on a higher indifference curve contain mere of either one or both goods and more goods are preferred to less of them.

Budget line :

A higher indifference curve shows a higher level of satisfaction than a lower one. Therefore, a consumer in his attempt to maximise satisfaction will try to reach the highest possible indifference curve. But in his pursuit of buying more and more goods and thus obtaining more and more satisfaction he has to work under two constraints : firstly, he has to pay the prices for the goods and, secondly, he has a limited money income with which to purchase the goods. These constraints are explained by budget line or price line.

In simple words a budget line shows all those combinations of two goods which the consumer can buy spending his given money income on the two goods at their given prices. All those combinations which are within the reach of the consumer (assuming that he spends all his money income) will lie on the budget line.



: Price Line

Fig. 11

It should be noted that any point outside the given price line, like H, will be beyond the reach of the consumer and any combination lying within the line, like K, shows under spending by the consumer.

2.6 Consumer's Equilibrium:

Having explained indifference curves and budget line, we are in a position to explain how a consumer reaches equilibrium position. A consumer is in equilibrium when he is deriving maximum possible satisfaction from the goods and is in no position to rearrange his purchases of goods. We assume that :

(i) the consumer has a given indifference map which shows his scale of preferences for various combinations of two goods X and Y.

(ii) he has a fixed money income which he has to spend wholly on goods X and Y.

(iii) prices of goods X and Y are given and are fixed for him.

To show which combination of two goods X and Y the consumer will buy to be in equilibrium we bring his indifference map and budget line together. We know by now, that the indifference map depicts the consumer's preference scale between various combinations of two goods and the budget line shows various

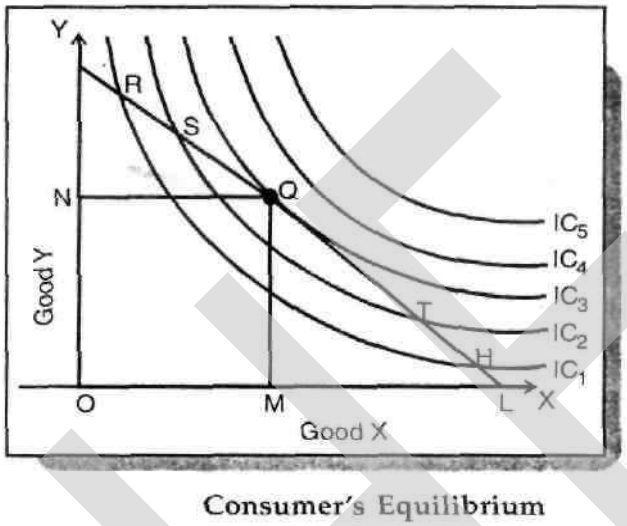


Fig. 12

combinations which he can afford to buy with his given money income and prices of the two goods. Consider Figure 12, in which IC_1, IC_2, IC_3, IC_4 and IC_5 are shown together with budget line PL for good X and good Y. Every combination on budget line PL costs the same. Thus combinations R, S, Q, T and H cost the same to the consumer. The consumer's aim is to Maximize his satisfaction and for this he will try to reach highest indifference curve.

But since there is a budget constraint he will be forced to remain on the given budget line, that is he will have to choose any combinations from among only those which lie on the given price line. Which combination will he choose? Suppose he chooses R, but we see that R lies

on a lower indifference curve IC_1, when he can very well afford S, Q or T lying on higher indifference curve. Similar is the case for other combinations on IC_1, like H. Again, suppose he chooses combination S (or T) lying on IC_2. But here again we see that the consumer can still reach a higher level of satisfaction remaining within his budget constraints i.e., he can afford to have combination Q lying on IC_3

because it lies on his budget line. Now what if he chooses combination Q? We find that this is the best choice because this combination lies not only on his budget line but also puts him on highest possible indifference curve i.e., IC_3 The consumer can very well wish to reach IC_4 or IC_5, but these indifference curves are beyond his reach given his money income. Thus the consumer will be at equilibrium at point Q on IC_3. What do we notice at point Q? We notice that at this point, his budget line PL is tangent to the indifference curve IC_3. In this equilibrium position (at Q), the consumer will buy OM of X and ON of Y.

Thus, we can say that the consumer is in equilibrium position when price line is tangent to the indifference curve or when the marginal rate of substitution of goods X and Y is equal to the ratio between the prices of the two goods.

Elasticity of Demand

In this lesson a detailed discussion regarding elasticity's as a measure of the responsiveness of one item to changes in another item is made. Elasticity is a common concept that economists, Business people and others rely upon for the measurement between two variables say for example the ratio of percentage change in quantity demanded to percentage change in some other factor like Price or Income.

The concept of price-elasticity of demand was first of all introduced in economics by Dr. Marshall. In simple words, price elasticity of demand is the ratio of percentage change in quantity demanded to the percentage change in price. In other words, price elasticity of demand is a measure of the relative change in quantity purchased of a good in response to a relative change in its price. It is, thus a rate at which the demand changes to the given change in prices. So, it means the rate or the degree of response in demand to the change in price. Thus, the co-efficient of price-elasticity of demand can be expressed as under:

$$E = \text{Pr}\textit{oportionat e change in Quantity Demanded}$$

^{d}Pr *oportionat e change in price*

Definitions of Price Elasticity of Demand

The concept of price elasticity of demand has been defined by different economists as under :

According to **Alfred Marshall**: "Elasticity of demand may be defined as the percentage change in quantity demanded to the percentage change in price."

According to **A.K. Cairncross** : "The elasticity of demand for a commodity is the rate at which quantity bought changes as the price changes."

According to **J.M. Keynes** : "The elasticity of demand is a measure of the relative change in quantity to a relative change in price."

According **to Kenneth Boulding** : "Elasticity of demand measures the responsiveness of demand to changes in price."

Degrees of Price Elasticity

Different commodities have different price elasticities. Some commodities have more elastic demand while others have relative elastic demand. Basically, the price elasticity of demand ranges from zero to infinity. It can be equal to zero, less than one, greater than one and equal to unity.

According to **Dr. Marshall** : "The elasticity or reponsiveness of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price and diminishes much or little for a given rise in price." However, some particular values of elasticity of demand have been explained as under ;

Perfectly Elastic Demand.

Perfectly elastic demand is said to h appen when a little change in price leads to an infinite change in quantity demanded. A small rise in price on the part of the seller reduces the demand to zero. In such a case the shape of the demand curve will be horizontal straight line as shown in figure 13

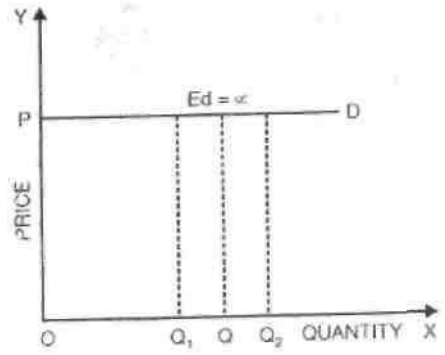
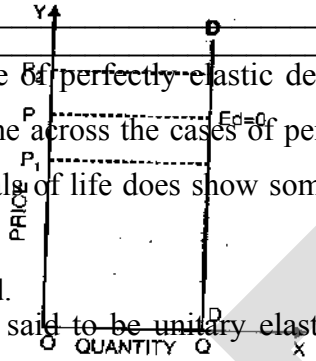


Fig - 13

The figure 13 shows that at the ruling price OP, the demand is infinite. A slight rise in price will contract the demand to zero. A slight fall in price will attract more consumers but the elasticiy of demand will remain infinite. But in real world, the cases of perfectly elastic demand are exceedingly rare and are not of any practical interest.

2. Perfectly inelastic Demand

Perfectly inelastic demand is opposite to perfectly elastic demand. Under the perfectly inelastic demand, irrespective of any rise or fall in price of a commodity, the quantity demanded remains the same. The elasticity of demand in this case will be equal to zero.In diagram 14, DD shows the perfectly inelastic demand. At price OP, the quantity demanded is OQ. Now, the price falls to OP, from OP_1, demand remains the same. Similarly, if the price rises to OP_2 the demand still remains the same. But just as



we do not see the example of perfectly elastic demand in the real world, in the same fashion it is difficult to come across the cases of perfectly inelastic demand because even the demand for bare essentials of life does show some degree of responsiveness to change in price.

3. Unitary Elastic Demand.

The demand is said to be unitary elastic when a given proportionate change in the price level brings about an equal proportionate change in quantity demanded. The numerical value of unitary elastic demand is exactly one i.e., ed = 1. Marshall calls it unit elastic. In figure 15, DD demand curve represents unitary elastic demand. This demand curve is called rectangular hyperbola. When price is OP, the quantity demanded is OQ_1. Now price falls to OP_1, the quantity demanded increases to OQ_1. The shaded area in the fig. equal in terms of price and quantity demanded denotes that in all cases price elasticity of demand is equal to one.

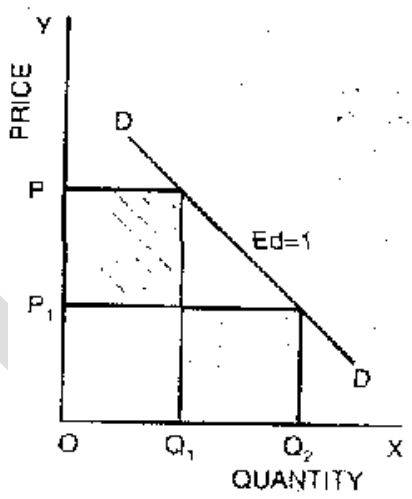


Fig – 15

4. Relatively Elastic Demand

Relatively elastic demand refers to a situation in which a small change in price leads to a big change in quantity demanded. In such a case elasticity of demand is said to be more than one. This has been shown in figure 16.

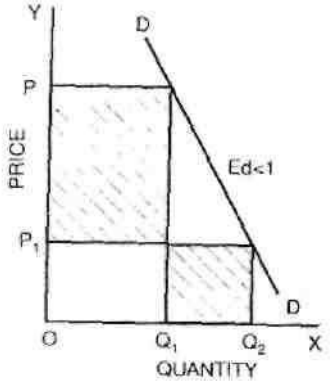
In fig.16, DD is the demand curve which indicates that when price is OP the quantity demanded is OQ_1, Now the price falls from OP to OP_1, the quantity demanded increases from OQ_1 to OQ_2 i.e. quantity demanded changes more than the change in price.

5. Relatively Inelastic Demand.

Under the relatively inelastic demand a given percentage change in price produces a relatively less percentage change in quantity demanded. In such a case elasticity of demand is said to be less than one as shown in figure 17.

All the five degrees of elasticity of demand have been shown in figure 18. On OX axis, quantity demanded and on OY axis price is given. It shows:

1. AB — Perfectly Inelastic Demand
2. CD — Perfectly Elastic Demand
3. EQ — Less Than Unitary Elastic Demand
4. EF — Greater Than Unitary Elastic Demand
5. MN — Unitary Elastic Demand.



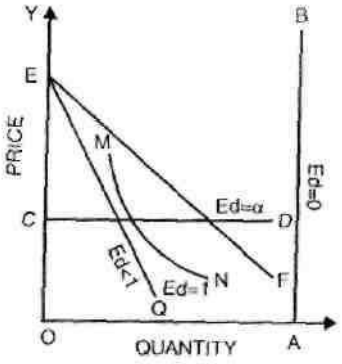


Fig. 17 **Fig. 18**

FACTORS DETERMINING PRICE ELASTICITY OF DEMAND

The factors that determine elasticity of demand are numberless. But the most

important among them are the nature, uses and prices of related goods and the level of income. They are stated below:

I. Nature of the commodity: Generally, all commodities can be dividend into three categories i.e.

(i) Necessaries of Life. For necessaries of life the demand is inelastic because people buy the required amount of goods whatever their price. For example, necessaries such as rice, salt, cloth are purchased whether they are dear or cheap.

(ii) Conventional Necessaries. The demand for conventional necessaries is less elastic or inelastic. People are accustomed to the use of goods like intoxicants which they purchase at any price. For example, drunkards consider opium and wine almost as a necessity as food and water. Therefore, they buy the same amount even when their prices are higher and highest.

(iii) Luxury Commodities. The demand for luxury is usually elastic as people buy more of them at a lower price and less at a higher price. For example, the demand of luxuries like silk, perfumes and ornaments increases at a lower price and diminishes at a higher price. Here, we must keep in mind that luxury is a relative term, which varies from person to person, place to place and from time to time. For example, what is a luxury to a poor man is a necessity to the rich. The luxury of the past may become a necessity of today. Similarly a commodity which is a necessity to one class may be a luxury to another. Hence, the elasticity of demand in such cases should have to be carefully expressed.

2. Substitutes. Demand is elastic for those goods which have substitutes and inelastic for those goods which have no substitutes. The availability of substitutes, thus, determines the elasticity of demand. For instance, tea and coffee are substitutes. The change in the price of tea affects the demand for coffee. Hence, the demand for coffee and tea is elastic.

3. Number of Uses. Elasticity of demand for any commodity depends on its number of uses. Demand is elastic; if a commodity has more uses and inelastic if it has only one use.

As coal has multiple uses, if its price falls it will be demanded more for cooking, heating, industrial purposes etc. But if its price rises, minimum will be demanded for every purpose.

4. Postponement. Demand is more elastic for goods the use of which can be postponed. For example, if the price of silk rises, its consumption can be postponed. The demand for silk is, therefore, elastic. Demand is inelastic for those goods the use of which is urgent and, therefore, cannot be postponed. The use of medicines cannot be put off. Hence, the demand for medicines is inelastic.

5. Raw Materials and Finished Goods. The demand for raw materials is inelastic but the demand for finished goods is elastic. For instance, raw cotton has inelastic demand but cloth has elastic demand. In the same way, petrol has inelastic demand but car itself has only elastic demand.

6. Price Level. The demand is elastic for moderate prices but inelastic for lower and higher prices. The rich and the poor do not bother about the prices of the goods that they buy. For example, rich buy Benaras silk and diamonds etc. at any price. But the poor buy coarse rice, cloth etc. whatever their prices are.

7. Income Level. The demand is inelastic for higher and lower income groups and elastic for middle income groups. The rich people with their higher income do not bother about the price. They may continue to buy the same amount whatever the price. The poor people with lower incomes buy always only the minimum requirements and, therefore, they are induced neither to buy more at a lower price nor less at a higher price. The middle income group is sensitive to the change in price. Thus, they buy more at a lower price and less at higher price.

8. Habits. If consumers are habituated of some commodities, the demand for such commodities will be usually inelastic. It is because that the consumer will use them even their prices go up. For example, a smoker does not smoke less when the price of cigarette goes up.

9. Nature of Expenditure. The elasticity of demand for a commodity also depends as to

how much part of the income is spent on that particular commodity. The demand for such commodities where a small part of income is spent is generally highly inelastic i.e. newspaper, boot-polish etc. On the other hand, the demand of such commodities where a significant part of income is spent, elasticity of demand is very elastic.

10. Distribution of Income. If the income is uniformly distributed in the society, a small change in price will affect the demand of the whole society and the demand will be elastic. In case of unequal distribution of income and wealth, a change in price will hardly influence the poor section of the society and the demand will be relatively inelastic.

11. Influence of Diminishing Marginal Utility. We know that utility falls when we consume more and more units but not in a uniform way. In case utility falls rapidly, it means that the consumer has no other near substitutes. As a result, demand is inelastic. Conversely, if the utility falls slowly, demand for such commodity would be elastic and raises much for a fall in price.

MEASUREMENT OF PRICE ELASTICITY OF DEMAND

There are five methods to measure the price elasticity of demand.

1. Total Expenditure Method.
2. Proportionate Method.
3. Point Elasticity of Demand.
4. Arc Elasticity of Demand.
5. Revenue Method.

Total Expenditure Method

Dr. Marshall has evolved the total expenditure method to measure the price elasticity of demand. According to this method, elasticity of demand can be measured by considering the change in price and the subsequent change in the total quantity of goods purchased and the total amount of money spend on it.

Total Outlay = Price x Quantity Demanded.

There are three possibilities:

(i) If with a fall in price (demand increases) the total expenditure increases or with a rise in

price (demand falls) the total expenditure falls, in that case the elasticity of demand is greater than one i.e. (Ed >1.)

(ii) If with a rise or fall in the price (demand falls or rises respectively), the total

expenditure remains the same, the demand will be unitary elastic i.e. (Ed = 1).

(iii) with a fall in price (Demand rises), the total expenditure also falls, and with a rise in

price (Demand falls) the total expenditure also rises, the demand is said to be less elastic

or elasticity of demand is less than one i.e. (Ed <1).

Table Representation: The method of total expenditure has been explained with the help of Table 3.

Price (P)	Quantity Demanded	Total	Elasticity of demand
10 9 8 7	1 2 3 4	1 0 1 8	Ed > 1
65	5 6	3 0 3	Ed = 1
43 21	7 8 9 10	2 8 2 4	Ed < 1

In the above Table 3, we find three possibilities:

1. More Elastic Demand.

When price is Rs. 10 the quantity demanded is 1 unit and total expenditure is 10.

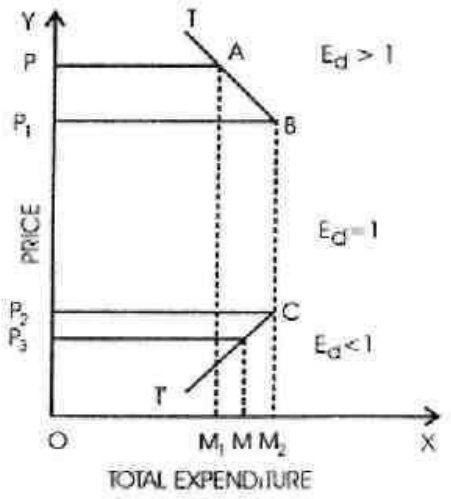
Now price falls from Rs. 10 to Rs. 6, the quantity demanded increases from 1 to 5 units and correspondingly the total expenditure increases from Rs. 10 to Rs. 30. Thus it is clear that with the fall in price, the total expenditure increases and vice-versa. So elasticity of demand is greater than one or Ed > 1.

2.Unitary Elastic Demand.

If price is Rs. 6, demand is 5 units so the total outlay is Rs. 30. Now price falls to Rs. 5, the demand increases to 6 units but the total expenditure remains the same i.e., Rs. 30. Thus it is clear that with the rise or fall in price, the total expenditure remains the same. The elasticity of demand in this case is equal to one or Ed = 1.

3.Less Elastic Demand.

If price is Rs. 5, demand is 6 and total outlay is Rs. 30. Now price falls from Rs. 5 to Re. 1. The demand increases from 6 units to 10 units and hence the total expenditure falls from Rs. 30 to Rs. 10. Thus it is clear that with the fall in price the total expenditure also falls and vice-versa. In this case, the elasticity of demand is less than one or Ed<l.



Diagrammatic Representation:

Measurement of price elasticity through total expenditure method can be shown with the help of fig. 19. In the figure 19 total expenditure has been shown on X-axis and price on Y-axis. Line TT' is the total expenditure line. When price of the commodity falls from OP to OP1 total expenditure increases from OM1 to OM2. The elasticity of demand is greater than one as is shown in TB portion of the figure. Now, suppose that the price of the commodity decreases from OP^1 to OP^3 the total expenditure falls from OM2 to OM. This is shown in T'C part of the figure which represents the less than unity elasticity of demand. In the same way, BC part of the figure represents the unit elasticity of demand. Thus it is clear that the changes in total expenditure due to changes in price also affect the elasticity of demand.

Proportionate Method

This method is also associated with the name of Dr. Marshall. According to this method, "price elasticity of demand is the ratio of percentage change in the amount demanded to the percentage change in price of the commodity." It is also known as the

Percentage Method, Flux Method, Ratio Method, and Arithmetic Method.

$$E_d = \frac{\text{Proportionate change in Quantity Demanded}}{\text{Proportionate change in price}}$$

Arc Elasticity of Demand

According to **Prof. Baumol:** "Arc elasticity is a measure of the average responsiveness to price change exhibited by a demand curve over some finite stretch of the curve".

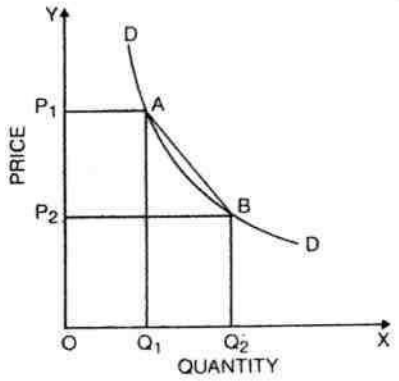
According to **Watson:** "Arc elasticity is the elasticity at the mid-point of an are of a demand curve."

According to **Leftwitch :** "When elasticity is computed between two separate points on a demand curve, the concept is called Are elasticity." This method of measuring elasticity of demand is also known as "Average Elasticity".

Are elasticity of demand in notational farm can be express with the help of a diagram 20.

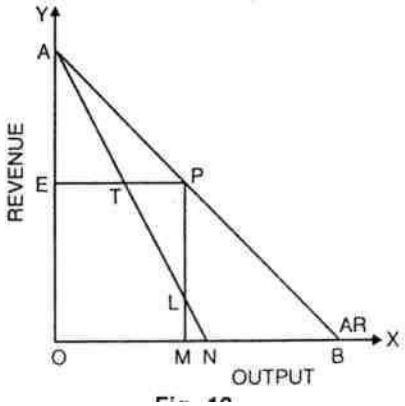
In figure 20 quantity is measured on X-axis while price on Y- axis. DD is the demand curve. Now if we want to measure the arc elasticity between A and B on the demand curve DD, we will have to take the average of prices OPl and OP2 as well as of quantities; Q1 and Q2.

$$E_A = [F + (F + \Delta F)] \; [Q + (Q + \Delta Q)] \qquad \Delta F$$



Revenue Method

Mrs.; Joan Robinson has given this method. She says that elasticity of demand can be measured with the help of average revenue and marginal revenue. Therefore, a sale proceeds that a firm obtains by selling its products is called its revenue. However, when total revenue is divided by the number of units sold, we get average revenue. On the contrary, when addition is made to the total revenue by the sale of one more unit of the commodity is called marginal revenue.



where Ed represents elasticity of demand, A = average revenue and M = marginal revenue. This method can be explained with the help of diagram 21.

In this diagram 21 revenue has been shown on OY-axis while quantity of goods on OX- axis. AB is the average revenue or demand curve and AN is the marginal revenue curve.

At point P on demand curve, elasticity of demand is calculated with the formula,

$$E_p = \frac{LowerFortion}{UpperFortion} \text{ or } \frac{FB}{FA}$$

We can see in the figure that A AEP and APMB are similar, thus ratio of their sides is also equal.

$$\frac{FB}{AE} = \frac{FM}{FA}$$ and; AAET and ATPL are congruent triangles, therefore PL = AE.

Putting PL in place of AE in the above equation, we shall get

$$E = \frac{FM}{FL}$$

In this way, if value of Ep is one it means that price elasticity of demand is unitary.

Similarly, if it is more than one, price elasticity of demand is greater than one and if it is less than one, price elasticity of demand is less than unity.

INCOME ELASTICITY OF DEMAND

According to **Stonier and Hague**: "Income elasticity of demand shows the way in which a

consumer's purchase of any good changes as a result of change in his income."

It shows the responsiveness of a consumer's purchase of a particular commodity to a change in his income. Income elasticity of demand means the ratio of percentage change in the quantity demanded to the percentage change in income. In brief income elasticity.

$$I = \frac{\textit{proportionate change in quantity purchased}}{\textit{proportionate change in income}}$$

I_e = *percentage change in demand/ percentage change in income*

Degrees of Income Elasticity of Demand

Positive income elasticity of Demand :

Positive income elasticity of demand is said to occur when with the increase in the income of the consumer, his demand for goods and services also increases and vice-versa. Income elasticity of demand is positive in case of normal goods.

In fig. 22, quantity of commodity T has been measured on X-axis and income of the consumer on Y-axis. DD is the positive income elasticity of demand curve. It slopes upward from left to right indicating that increase in income is accompanied by increase in demand of goods and services and vice-versa.

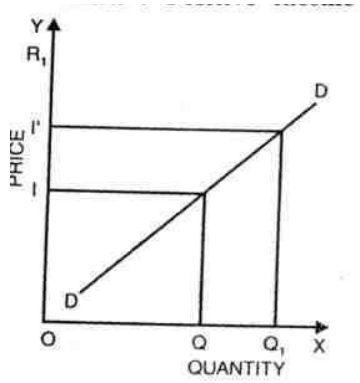


Fig. 22

1.Income Elasticity is Unity. The change in demand is proportionate to the change in income. For example

Income Elasticity = 1 when $\frac{25\% \textit{ change in demand}}{25\% \textit{ change in income}}$

2. Income Elasticity Greater than One. When the change in demand is more than proportionate change in income, income elasticity of demand is greater than one or unity. For example,

Income Elasticity >1 when

15% *change in demand* / 10% *change in income* = 1.5

3. Income Elasticity Less than One. If change in demand is less than proportionate change in income, income elasticity of demand is less than one or unity. For example.

Income Elasticity <1 when

20% *change in demand /* 40% *change in income = 0.5*

ii) Negative Income Elasticity of Demand: Negative income elasticity of demand is said to occur when increase in the income of the consumers is accompanied by fall in demand of goods and services and vice-versa. It is the case of giffen goods.

In fig. 23 when income of the consumer is 01, demand for goods and services is OX. Now as the income I1 increases to I1 quantity demanded falls o to OX1. Again as the income increases to 12, quantity demanded falls to OX2. DD is the negative income elasticity of demand curve.

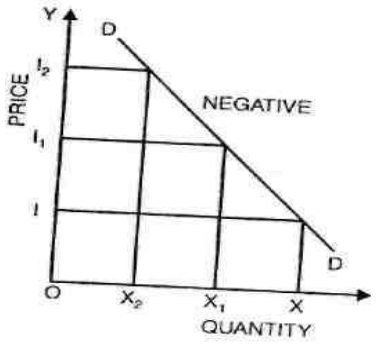
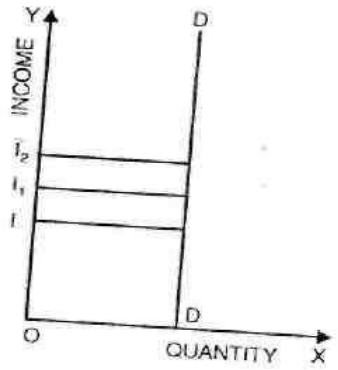


Fig. 23

(iii) Zero Income Elasticity of Demand:

Zero income elasticity of demand is said to exist when increase or decrease in income has no impact on the demand of goods and services. In fig. 24 initially when income is OI, quantity demanded is OD. Now, income increases to OI2 demand Remains constant i.e. OD. Even when income reduces to 01 , quantity demanded remains OD.

Generally, as income increases demand for goods increases. But in some cases, demand may not change to change in income or demand may diminish for an increase in income. The former case represents zero income elasticity. Income elasticity is zero if a change in income fails to produce any change in demand. Income elasticity is negative, if an increase in income leads to a reduction of demand. This happens only in the case of inferior goods. But in all other cases it is positive.



In short income elasticity is greater than one for luxuries but less than one for necessaries.

CROSS ELASTICITY OF DEMAND

It is the ratio of proportionate change in the quantity demanded of Y to a given proportionate change in the price of the related commodity X. It is a measure of relative change in the quantity demanded of a commodity due to a change in the price of its substitute complement. It can be expressed as

$$\text{€} = \frac{\textit{proportionate change in the quantity demanded of } Y}{\textit{proportionate change in the price of } X}$$

Cross elasticity is zero, if a change in the price of one commodity will not affect the quantity demanded of the other. In the case of goods which are not related to each other, cross elasticity of demand is zero.

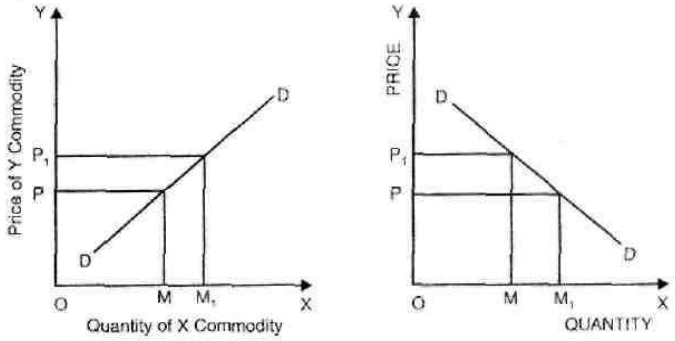
Types of Cross Elasticity of Demand

1.Positive :

When goods are substitute of each other than cross elasticity of demanded is positive. In other words, when an increase in the price of Y leads to an increase in the demand of X. For instance with the increase in price of a tea, demand of coffee will increase. In fig 25 Quantity has been measured on OX axis and price on OY axis. At price OP of Y commodity, demand of X – commodity is OM. Now as price Of Y commodity increase to OP1 demand of X-commodity increases to OM1. Thus, cross, elasticity of demand is positive.

2. Negative:

In case of complementary goods, cross elasticity of demand is negative. A proportionate increase in price of one commodity leads to a proportionate fall in the demand, of .another commodity because both are demanded jointly. In fig. 26 quantity has been measured on OX-axis while price has been measured on OY-axis. When the price of commodity increases from OP to OP_1 quantity demanded falls from OM to OM_1 Thus, cross elasticity of demand is negative.



3. Zero:

Cross elasticity of demand is zero when two goods are related to each other. For instance, increase in price of car does not affect the demand of cloth. Thus, cross elasticity of demand is zero. It has been shown in fig. 27

Therefore, it can be concluded that cross elasticity depends upon Substitutability is perfect, cross elasticity is infinite; if on the other hand, substitutability does not exist, cross elasticity is zero. In the case of complementary goods like jointly demanded goods cross elasticity is negative. A rise in the price of one commodity X will mean not only decrease in the quantity of X but also decrease in the quantity demanded of Y because both are demanded together.

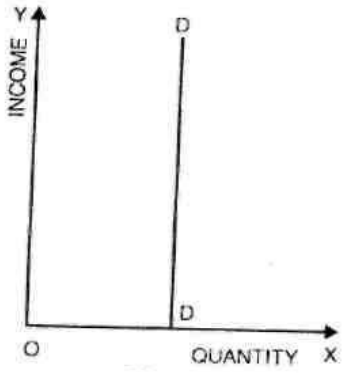


Fig - 27

Limitations of Cross Elasticity of Demand

The cross elasticity of demand is a useful measure of price-demand relationships between commodities. But this concept has following two limitations.

1. Negative Cross Elasticity does not always mean complementarily.
2. Cross Elasticity of Demand is only a one-way Relationship.

IMPORTANCE OF ELASTICITY OF DEMAND

The concept of elasticity of demand is of great importance in practical life. Its main points are given as under:

1. Useful for Business: It enables the business in general and the monopolists in particular to fix the price. Studying the nature of demand the monopolist fixes higher prices for those goods which have inelastic demand and lower prices for goods which have elastic demand. In this way, this helps him to maximise his profit.

2. Fixation of Prices: It is very useful to fix the price of jointly supplied goods. In the case of joint products like paddy and straw, the cost of production of each is not known. The price of each is then fixed by its elastic and inelastic demand.

3. Helpful to Finance Minister: It helps the Finance Minister to levy tax on goods. After levying taxes more and more on goods which have inelastic demand, the Government collects more revenue from the people without causing them inconvenience. Moreover, it is also useful for the planning.

4. Fixation of Wages: It guides the producers to fix wages for labourers. They fix high or low wages according to the elastic or inelastic demand for the labour.

5. In the Sphere of International Trade: It is of greater significance in the sphere of international trade. It helps to calculate the terms of trade and the consequent gain from foreign trade. If the demand for home product is inelastic, the terms of trade will be profitable to the home country.

6. Paradox of Poverty. It explains the paradox of poverty in the midst of plenty. A bumper crop instead of bringing prosperity may result in disaster, if the demand for it is inelastic. This is specially so, if the products are perishable and not storable.

7. Significant for Government Economic Policies. The knowledge of elasticity of demand is very important for the government in such matters as controlling

of business cycles, removing inflationary and deflationary gaps in the economy. Similarly, for price stabilization and the purchase and sale of stocks, information about elasticity of demand is most useful.

8. **Determination of Price of Public Utilities**. This concept is significant in the determination of the prices of public utility services. Economic welfare of the society largely depends upon the cheap available

Meaning of Demand Forecasting

Future is uncertain. There is great deal of uncertainty with regard to demand. Since the demand is uncertain, production, cost, revenue, profit etc. are also uncertain. Through forecasting it is possible to minimise the uncertainties. Forecasting simply refers to estimating or anticipating future events. It is an attempt to foresee the future by examining the past. Thus demand forecasting means estimating or anticipating future demand on the basis of past data.

Objectives of Demand Forecasting

A. Short Term Objectives

1. To help in preparing suitable sales and production policies.
2. To help in ensuring a regular supply of raw materials.
3. To reduce the cost of purchase and avoid unnecessary purchase.
4. To ensure best utilization of machines.
5. To make arrangements for skilled and unskilled workers so that suitable labour force may be maintained.
6. To help in the determination of a suitable price policy.
7. To determine financial requirements.
8. To determine separate sales targets for all the sales territories.
9. To eliminate the problem of under or over production.

B. Long term Objectives

1. To plan long term production.
2. To plan plant capacity.
3. To estimate the requirements of workers for long period and make arrangements.
4. To determine an appropriate dividend policy.
5. To help the proper capital budgeting.
6. To plan long term financial requirements.
7. To forecast the future problems of material supplies and energy crisis.

Factors Affecting Demand Forecasting

For making a good forecast, it is essential to consider the various factors governing demand forecasting. These factors are summarized as follows.

1. Prevailing business conditions: While preparing demand forecast it becomes necessary to study the general economic conditions very carefully. These include the price level changes, change in national income, percapita income, consumption pattern, savings and investment habits, employment etc.

2. Conditions within the industry: Every business enterprise is only a unit of a particular industry. Sales of that business enterprise are only a part of the total sales of that industry. Therefore, while preparing demand forecasts for a particular business enterprise, it becomes necessary to study the changes in the demand of the whole industry, number of units within the industry, design and quality of product, price policy, competition within the industry etc.

3. Conditions within the firm: Internal factors of the firm also affect the demand forecast. These factors include plant capacity of the firm, quality of the product, price of the product, advertising and distribution policies, production policies, financial policies etc.

4. Factors affecting export trade: If a firm is engaged in export trade also it should consider the factors affecting the export trade. These factors include import and export control, terms and conditions of export, exim policy, export conditions, export finance etc.

5. Market behaviour : While preparing demand forecast, it is required to consider the market behavior which brings about changes in demand.

6. Sociological conditions: Sociological factors have their own impact on demand forecast of the company. These conditions relate to size of population, density, change in age groups, size of family, family life cycle, level of education, family income, social awareness etc.

7. Psychological conditions: While estimating the demand for the product, it becomes necessary to take into consideration such factors as changes in consumer tastes, habits, fashions, likes and dislikes, attitudes, perception, life styles, cultural and religious bents etc.

8. Competitive conditions: The competitive conditions within the industry may change. Competitors may enter into market or go out of market. A demand forecast prepared without considering the activities of competitors may not be correct.

Process of Demand Forecasting/ Steps in Demand Forecasting

Demand forecasting involves the following steps:

1. Determine the purpose for which forecasts are used.
2. Subdivide the demand forecasting programme into small I parts on the basis of product or sales territories or markets.
3. Determine the factors affecting the sale of each product and their relative importance.
4. Select the forecasting methods.
5. Study the activities of competitors.
6. Prepare preliminary sales estimates after, collecting necessary data.
7. Analyse advertisement policies, sales promotion plans, personal sales arrangements etc. and ascertain how far these programmes have been successful in promoting the sales.
8. Evaluate the demand forecasts monthly, quarterly, half yearly or yearly and necessary adjustments should be done.
9. Prepare the final demand forecast on the basis of preliminary forecasts and the results of evaluation.

Methods Of Demand Forecasting (For Established Products)

There are several methods to predict the future demand. All methods can be broadly classified into two. (A) Survey methods, (B) Statistical methods

(A) Survey methods

Under this method surveys are conducted to collect information about the future purchase plans of potential consumers. Survey methods help in obtaining information about the desires, likes and dislikes of consumers through collecting the opinion of experts or by interviewing the consumers. Survey methods are used for short term forecasting. Important survey methods are (a) consumers interview method, (b) collective opinion or sales force opinion methodic) experts opinion method, (d) consumers clinic and (f) end use method.

(a) Consumers' interview method

(Consumers survey): Under this method, consumers are interviewed directly and asked the quantity they would like to buy. After collecting the data, the total demand for the product is calculated. This is done by adding up all individual demands. Under the consumer interview method, either all consumers or selected few are interviewed. When all the consumers are interviewed, the method is known as complete enumeration method. When only a selected group of consumers are interviewed, it is known as sample survey method

Advantages

1. It is a simple method because it is not based on past record.

2. It suitable for industrial products.
3. The results are likely to be more accurate.
4. This method can be used for forecasting the demand of a new product.

Disadvantages

1. It is expensive and time consuming.
2. Consumers may not give their secrets or buying plans.
3. This method is not suitable for long term forecasting.
4. It is not suitable when the number of consumer is large.

(b)Collective opinion method: Under this method the salesmen estimate the expected sales in their respective territories on the basis of previous experience. Then demand is estimated after combining the individual forecasts (sales estimates) of the salesmen.

This method is also known as sales force opinion method.

Advantages

This method is simple.

1. It is based on the first hand knowledge of Salesmen.
2. This method is particularly useful for estimating demand of new products.
3. It utilises the specialised knowledge of salesmen who are in close touch with the prevailing market conditions.

Disadvantages

1. The forecasts may not be reliable if the salespeople are not trained.
2. It is not suitable for long period estimation.
3. It is not flexible.
4. Salesmen may give lower estimates that make possible easy achievement of sales quotas fixed for each salesman.

(c)Experts' opinion method:

This method was originally developed at Rand Corporation in 1950 by Olaf Helmer, Dalkey and Gordon. Under this method, demand is estimated on the basis of opinions of experts and distributors other than salesmen and ordinary consumers. This method is also known as Delphi method. Delphi is the ancient Greek temple where people come and prey for information about their future.

Advantages

1. Forecast can be made quickly and economically
2. This is a reliable method because estimates are made on the basis of knowledge and

experience of sales experts.

3. The firm need not spare its time on preparing estimates of demand.
4. This method is suitable for new products.

Disadvantages

1. This method is expensive.
2. This method sometimes lacks reliability

(d)Consumer clinics:

In this method some selected buyers are given certain amounts of money and asked to buy the products. Then the prices are changed and the consumers are asked to make fresh purchases with the given money. In this way the consumers" responses to price changes are observed. Thus the behaviour of the consumers is studied. On this basis demand is estimated. This method is an improvement over consumer's interview method.

Merits

1. It provides an opportunity to study the behaviour of consumers directly.
2. It provides reliable and realistic picture about future demand.
3. It gives useful information to aid in the decision making process.

Demerits

1. It is a time consuming method.
2. Selecting the participants is very difficult.
3. It is expensive.
4. Consumers may take it as a game. They may not reveal their preferences.

(e) End use method:

This method is based on the fact that a product generally has different uses. In the end use method, first a list of end users (final consumers, individual industries, exporters etc.) is prepared. Then the future demand for the product is found either directly from the end users or indirectly by estimating their future growth. Then the demand of all end users of the product is added to get the total demand for the product.

Statistical Methods

Statistical methods use the past data as a guide for knowing the level of future demand. Statistical methods are generally used for long run forecasting. These methods are used for established products. Statistical methods include: (i) Trend projection method, (ii) Regression and Correlation, (iii) Extrapolation method, (iv) Simultaneous equation method, and (v) Barometric method.

(i)Trend projection method:

Future sales are based on the past sales, because future is the grand-child of the past and child of the present. Under the trend projection method demand is estimated on the basis of analysis of past data. This method makes use of time series (data over a period of time). We try to ascertain the trend in the time series. The trend in the time series can be estimated by using any one of the following four methods: (a) Least-square method, (b) Free- hand method, (c) Moving average method and (d) semi-average method.

(ii) Regression and Correlation:

These methods combine economic theory and statistical technique of estimation. Under these methods the relationship between the sales (dependent variable) and other variables (independent variables such as price of related goods, income, advertisement etc.) is ascertained. Such relationship established on the basis of past data may be used to analyse the future trend. The regression and correlation analysis is also called the econometric model building.

(iii) Extrapolation:

Under this statistical method, the future demand can be extrapolated by applying Binomial expansion method. This method is used on the assumption that the rate of charge in demand in the past has been uniform.

(iv) Simultaneous equation method.-

This involves the development of a complete econometric model which can explain the behaviour of all the variables which the company can control. This method is not very popular.

(v) Barometric technique:

This is an improvement over the trend projection method. According to this technique the events of the present can be used to predict the directions of change m the future. Here certain economic and statistical indicators from the selected time series are used to predict variables. Personal income, non-agricultural placements, gross national income, prices of industrial materials, wholesale commodity prices, industrial production, bank deposits etc. are some of the most commonly used indicators.

Advantages of Statistical Methods

1 The method of estimation is scientific

2 Estimation is based on the theoretical relationship between sales (dependent variable)

and price, advertising, income etc. (independent variables)

3 These are less expensive.

4 Results are relatively more reliable.

Disadvantages of Statistical Methods

1 These methods involve complicated calculations.

2 These do not rely much on personal skill and experience.

3 These methods require considerable technical skill and experience in order to be effective.

9.6 Methods of Demand Forecasting for New Products

Demand forecasting of new product is more difficult than forecasting for existing product. The reason is that the product is not available. Hence, no historical data are available. In these conditions the forecasting is to be done by taking into consideration the inclination and wishes of the customers to purchase. For this a research is to be conducted. But there is one problem that it is difficult for a customer to say anything without seeing and using the product before. Thus it is very difficult to forecast the demand for new products. Any way Prof. Joel Dean has suggested the following methods for forecasting demand of new products:

1. Evolutionary approach:

This method is based on the assumption that the new product is the improvement and evolution of the old product. The demand is forecasted on the basis of the demand of the old product. For example, the demand for black and white TV should be taken in to consideration while forecasting the demand for colour TV sets because the latter is an improvement of the former.

2. Substitute approach:

Here the new product is treated as a substitute of an existing product, e.g. polythene bags for cloth bags. Thus the demand for a new product is analysed as a substitute for some existing goods or service.

3. Growth curve approach:

Under this method the growth rate of demand of a new product is estimated on the basis of the growth rate of demand of an existing product. Suppose Pears soap is in use and a new cosmetic is to be introduced in the market. In this case the average sale of Pears soap will give an idea as to how the new cosmetic will be accepted by the consumers.

4. Opinion poll approach:

Under this method the demand for a new product is estimated on the basis of information collected from the direct interviews (survey) with consumers.

5. Sales Experience approach:

Under this method, the new product is offered for sale in a sample market, i.e. by direct mail or through multiple shop or departmental shop. From this the total demand is estimated for the whole market.

6. Vicarious approach:

This method consists of surveying consumers' reactions through the specialised dealers who are in touch with consumers. The dealers are able to know as to how the customers will accept the new product. On the basis of their reports demand can be estimated. The above methods are not mutually exclusive. It is de desirable to use a combination of two or more methods in order to get better results.

Supply Function

Responsiveness of producers to changes in the price of their goods or services. As a general rule, if prices rise so does the supply. Elasticity of supply is measured as the ratio of proportionate change in the quantity supplied to the proportionate change in price. High elasticity indicates the supply is sensitive to changes in prices, low elasticity indicates little sensitivity to price changes, and no elasticity means no relationship with price. Also called price elasticity of supply. Price elasticity of supply (PES) measures the responsiveness of quantity supplied to a change in price. It is necessary for a firm to know how quickly, and effectively, it can respond to changing market conditions, especially to price changes. The following equation can be used to calculate PES.

$$\frac{\%\text{ change in quanity supplied}}{\%\text{ change in price}}$$

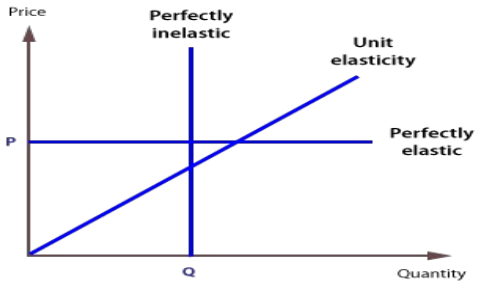
While the coefficient for PES is *positive* in value, it may range from 0,*perfectly inelastic*, to infinite, *perfectly elastic*. The following example explains the elasticity of supply by

A firm's market price increases from £1 to £1.10, and its supply increases from 10m to 12.5m. PES is: +25 +10 = (+) 2.5

The positive sign reflects the fact that higher prices will act an incentive to supply more. Because the coefficient is greater than one, PES is elastic and the firm is responsive to changes in price. This will give it a *competitive advantage* over its rivals. Extreme cases

There are three *extreme cases* of PES.

1. Perfectly elastic, where supply is infinite at any one price.
2. Perfectly inelastic, where only one quantity can be supplied.
3. Unit elasticity, which graphically is shown as a linear supply curve coming from the origin.



Factors affecting supply

Innumerable factors and circumstances could affect a seller's willingness or ability to produce and sell a good. Some of the more common factors are:

Good's own price:

The basic supply relationship is between the price of a good and the quantity supplied. Although there is no "Law of Supply", generally, the relationship is positive, meaning that an increase in price will induce an increase in the quantity supplied.

Prices of related goods:

For purposes of supply analysis related goods refer to goods from which inputs are derived to be used in the production of the primary good. For example, Spam is made from pork shoulders and ham. Both are derived from pigs. Therefore pigs would be considered a related good to Spam. In this case the relationship would be negative or inverse. If the price of pigs goes up the supply of Spam would decrease (supply curve shifts left) because the cost of production would have increased. A related good may also be a good that can be produced with the firm's existing factors of production.

For example, suppose that a firm produces leather belts, and that the firm's managers learn that leather pouches for smartphones are more profitable than belts. The firm might reduce its production of belts and begin production of cell phone pouches based on this information. Finally, a change in the price of a joint product will affect supply. For example beef products and anani sikim leather are joint products. If a company runs both a beef processing operation and a tannery an increase in the price of steaks would mean that more cattle are processed which would increase the supply of leather.

Conditions of production:

The most significant factor here is the state of technology. If there is a technological advancement in one good's production, the supply increases. Other variables may also affect

production conditions. For instance, for agricultural goods, weather is crucial for it may affect the production outputs.

Expectations:

Sellers' are concerning future market conditions can directly affect supply. If the seller believes that the demand for his product will sharply increase in the foreseeable future the firm owner may immediately increase production in anticipation of future price increases. The supply curve would shift out.

Price of inputs: Inputs include land, labor, energy and raw materials. If the price of inputs increases the supply curve will shift left as sellers are less willing or able to sell goods at any given price. For example, if the price of electricity increased a seller may reduce his supply of his product because of the increased costs of production.

Number of suppliers:

The market supply curve is the horizontal summation of the individual supply curves. As more firms enter the industry the market supply curve will shift out driving down prices.

Government policies and regulations:

Government intervention can have a significant effect on supply. Government intervention can take many forms including environmental and health regulations, hour and wage laws, taxes, electrical and natural gas rates and zoning and land use regulations. This list is not exhaustive. All facts and circumstances that are relevant to a seller's willingness or ability to produce and sell goods can affect supply. For example, if the forecast is for snow retail sellers will respond by increasing their stocks of snow sleds or skis or winter clothing or bread and milk.

Determinants of PES

How firms respond to changes in market conditions, especially price, is an important consideration for the firm itself, and to an understanding of how markets work.

The key considerations are:

- Are resource inputs readily *available*?
- Are factors *mobile* - are workers prepared to move to where they are needed?
- Can finished products be easily *stored*, and are there existing stocks?
- Is production running at *full capacity*?
- How long and complex is the *production cycle* or production process?

What is the most desirable PES for a firm?

It is desirable for a firm to be highly responsive to changes in price and other market conditions. This is because a high PES makes the firm more *competitive* than its rivals and it allows the firm to generate more revenue and profits.

Improving PES

Because a high PES is desirable, it may be necessary for firms to undertake actions that improve their speed of response to changes in market conditions. Examples of these actions include:

- Creating spare capacity
- Using the latest technology
- Keeping sufficient stocks
- Developing better storage systems
- Prolonging the shelf life of products
- Developing better distribution systems
- Providing training for workers
- Having flexible workers who can do a range of jobs
- Locating production near to the market
- Allowing inward migration of labour if there is a labour shortage

Supply elasticity is defined as the percentage change in quantity supplied divided by the percentage change in price. It is calculated as per the following formula:

Price Elasticity of Supply

This measures the responsiveness of quantity supplied to a change in price.

$$PES = \frac{\%\ \text{change in Q.S}}{\%\ \text{change in P}}$$

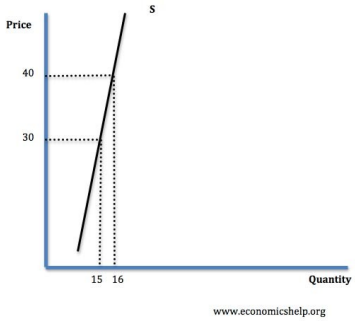
The price elasticity of supply (PES) is measured by % change in Q.S / % change in price.

- If price of a cappuccino increases 10%, and the supply increases 20%. We say the PES is 2.0
- If the price of bananas falls 12% and the quantity supplied falls 2%. We say the PES = 2/12

  = 0.16

Inelastic supply

This means that an increase in price leads to a smaller % change in demand. Therefore PES <1

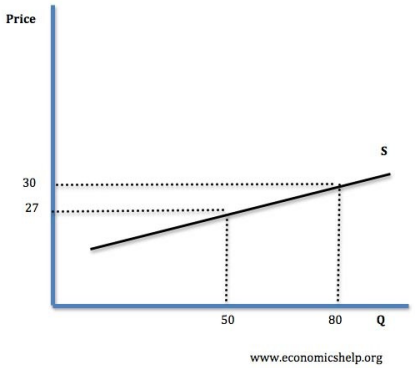


Supply could be inelastic for the following reasons

- Firms operating close to full capacity.
- Firms have low levels of stocks, therefore there are no surplus goods to sell
- In the short term, capital is fixed in the short run e.g. firms do not have time to build a bigger factory.
- If it is difficult to employ factors of production, e.g. if highly skilled labour is needed
- With agricultural products supply is inelastic in the short run, because it takes at least six months to grow crops, in September the farmer cannot suddenly produce more potatoes if the price goes up.

Elastic supply

This occurs when an increase in price leads to a bigger % increase in supply, therefore PES >1



- In this case, PES = 60% / 11% = 5.45

Supply could be elastic for the following reasons

- If there is spare capacity in the factory.
- If there are stocks available.
- In the long run supply will be more elastic because capital can be varied.
- If it is easy to employ more factors of production.

POSSIBLE QUESTIONS - PART – B

1. Define the term Demand?
2. What do you mean by the Law of Demand?
3. Explain the term market equilibrium?
4. Define the term Law of Supply?
5. What are the three types of Demand?
6. Give the meaning for producer goods and consumer goods?
7. Give the meaning for Short-Run Demand and Long-Run Demand?
8. What do you mean by Elasticity of Supply?
9. Give the meaning for producer goods and consumer goods?
10. Give the meaning for Autonomous Demand and Derived Demand?
11. What do you mean by Elasticity of Supply?
12. Point out the factors influencing the demand?
13. List out the various factors affecting the demand?
14. List out the Factors affecting elasticity of supply?
15. When a firm is said to be an equilibrium level?

***CIA – 3 X 2 = 6 Marks**
****ESE – 5 X 2 = 10 Marks**

PART - C

1. Discuss about Demand Distinctions with suitable examples.
2. Determine the significance of price elasticity of demand?
3. Define the term Supply and enumerate the factors influencing supply?
4. Analyze the significance of Income elasticity of demand?
5. Describe the generalized supply functions?
6. Enumerate the factors involved in price elasticity of Supply?
7. Analyze the significance of Price elasticity of demand?
8. Explain the three types of demand?
9. Explain the Price Elasticity of Demand with suitable diagramme?
10. Analyze the significance of changes in market equilibrium?

***CIA – 3 X 8 = 24 Marks (EITHER OR TYPE)**
****ESE – 5 X 6 = 30 Marks (EITHER OR TYPE)**

Unit – II : Producer and Optimal production choice: Optimizing behavior in short run (Geometry of product curves, law of diminishing marginal productivity, three stages of Production), Optimizing behavior in long run isoquants, isocost line, optimal combination of resources) Costs and scale : Traditional theory of cost (short run and long run, geometry of cost curves, envelope curves) – Modern theory of cost (short run and long run) – Economies of scale – Economies of Scope.

The word 'cost' has different meanings in different situations. The accounting cost concept or the historical cost concept is not useful as such for business decision- making. The accounting records end up with the balance sheet and income statements which are meant for legal, financial and tax needs of the enterprise. The financial recordings reveal what has been happening. It is a historical recording which is not of very much help to the managerial economist in his business decision- making.

The actual cost is not the relevant cost concept for business decision-making because it only reveals what has been happening. The decision-making concepts of cost aim at projecting what will happen in the alternative courses of action. Business decisions involve plans for the future and require choices among different plans. These decisions necessitate profitability calculations for which a comparison of future revenues and future expenses of each alternative plan is needed.

Various Concepts of Costs

A managerial economist must have a proper understanding of the different cost concepts which are essential for clear business thinking. The several alternative bases of classifying cost and the relevance of each for different kinds of problems are to be studied. The various relevant concepts of costs used in business decisions are given below.

Total, Average and Marginal Costs

Total cost is the total cash payment made for the input needed for production. It may

be explicit or implicit is the sum total of the fixed and variable costs. Average cost is the cost per unit of output. It is obtained by dividing the total cost (TC) by the total quantity produced (Q)

Average Cost $= \frac{TC}{Q}$

Marginal cost is the additional cost incurred to produce an additional unit of output. Or it is the cost of the marginal unit produced.

Example

A company produces 1000 typewriters per annum. Total fixed cost is Rs. 1,00,000 per annum. Direct material cost per typewriter is Rs. 200 and direct labour cost Rs. 100. Variable cost per typewriter = direct material + direct labour = 200 + 100 = Rs. 300

Total variable cost (1000x300) = Rs.300000
Fixed Cost = Rs. 100000
Total cost = Rs.400000
TC = Rs. 400000
Average Cost $= TC/Q$ = Rs. 400

If output is increased by one typewriter, the cost will appear as follows:

Total variable cost (1001x300) = 300300
Fixed cost = 100000
Total = 400300

Here the additional cost incurred to produce the 1001th typewriter is Rs.300 (400300 - 400000). Therefore, the marginal cost per typewriter is Rs.300

Fixed and Variable Costs

This classification is made on the basis of the degree to which they vary with the changes in volume. Fixed cost is that cost which remains constant up to a certain

level of output. It is not affected by the changes in the volume of production. Then fixed cost per unit aries with output rate. When the production increases, fixed cost per unit decreases. Fixed cost includes salary paid to administrative staff, depreciation of fixed assets, rent of factory etc. These costs are fixed in the sense that they do not change in short-run.

Variable cost varies directly with the variation in output. An increase in total output results in an increase in total variable costs and decrease in total output results in a proportionate decline in the total variable costs. The variable cost per unit will be constant. Variable costs include the costs of all inputs that vary with output like raw materials, running costs of fixed assets such as fuel, ordinary repairs, routine maintenance expenditure, direct labour charges etc.

The distinction of cost is important in forecasting the effect of short-run changes in volume upon costs and profits.

Short-Run and Long-Run Costs

This cost distinction is based on the time element. Short-Run is a period during which the physical capacity of the firm remains fixed. Any increase in output during this period is possible only by using the existing physical capacity more intensively. Long-Run is a period during which it is possible to change the firm's physical capacity. All the inputs become variable in the long-term.

Short-Run cost is that which varies with output when the physical I capacity remains constant. Long-Run costs are those which vary with output when all the inputs are variable. Short-Run costs are otherwise called variable costs. A firm wishing to change output quickly can do it only by increasing the variable factors. Short- Run cost concept helps the manager to take decision when a firm has to decide whether or not to produce more or less with a given plant. Long-Run cost analysis helps to take investment decisions. Long-Run increase in output may necessitate installation of more capital equipment.

Opportunity Costs and Outlay Costs

This distinction is made on the basis of the nature of the sacrifice made. Outlay costs are those expenses which are actually incurred by the firm. These are the actual payments made for labour, material, plant, building, machinery, traveling, transporting etc. These are the expense items that appear in the books of accounts. Outlay cost is an accounting cost concept. It is also called absolute cost or actual cost. Whenever the inputs are to be bought for cash the outlay concept is to be applied.

A businessman chooses and investment proposal from different investment opportunities. Before taking the decision he has to compare all the opportunities and choose the best. When he chooses the best he sacrifices the possibility of making profit from other investment opportunities. The cost of his choice is the return that he could have earned from other investment opportunities he has given up or sacrificed. A businessman decides to use his own money to buy a machine for the business. The cost of that money is the probable return on the money from the next most acceptable alternative investment. If he invested the money at 12 percent interest, the opportunity cost of investing in his own business would be the 12 percent interest he has forgone.

The outlay concept is applied when the inputs are to be bought from the market. When a firm decides to make the inputs rather than buying it from the market the

opportunity cost concept is to be applied. For example, in a cloth mill, instead' of buying the yarn from the market they spin it themselves. The cost of this yam is really the price at which the yarn could be sold if it were not used by them for weaving cloth.

The opportunity cost concept is made use of for long-run decisions. For example, the cost of higher education of a student should not only be the tuition fees and book costs but it also includes the earnings foregone by not working. This concept is very important in capital expenditure budgeting. The cost of acquiring a petrol pump in Trivandrum City by spending Rs. 6 lakhs is not usually the interest for that borrowed money but it is the profit that would have been made if that Rs. 6 lakhs had been invested in an offset printing press, which is the next best investment opportunity.

Opportunity cost concept is useful for taking short-rum decisions also. In boom periods the scarce lathe capacity used for making a product involves the opportunity cost of not using it to make some other product that can also produce profit. Opportunity cost is the cost concept to use when the supply of inputs is strictly limited. Estimates of cost of capital are essentially founded on an opportunity cost concept of investment return. Investment decision involves opportunity costs measurable in terms of sacrificed income from alternative investments. The opportunity cost of any action is therefore measured by the value of the most favorable alternative course which has to be foregone if that action is taken.

Opportunity cost arises only when there is an alternative. If there is no alternative, opportunity cost is the estimated earnings of the next best use. Thus it represents only the sacrificed alternative. Hence it does not appear in financial accounts. But this concept is of very great use in managerial decision- making.

Out-of-pocket and Book Costs

Out-of-pocket costs are those costs that involve current cash payment. Wages, rent, interest etc., are examples of this. The out-of-pocket costs are also called explicit costs. Book costs do not require current cash expenditure. Unpaid salary of the owner manager, depreciation, and unpaid interest cost of owner's own fund are examples of book costs. Book costs may be called implicit costs. But the book costs are taken into account in determining the legal dividend payable during a period. Both book costs and out-of-pocket costs are considered for all decisions. Book cost is the cost of self owned factors of production. The book cost can be converted into out-of-pocket cost. If a self-

owned machinery is sold out and the service of the same is hired, the hiring charges form the out-of-pocket cost The distinction is very helpful in taking liquidity decisions.

Incremental and Sunk costs

Incremental cost is the additional cost due to a change in the level or nature of business activity. The change may be caused by adding a new product, adding new machinery, replacing machinery by a better one etc. Incremental or differential cost is not marginal cost. Marginal cost is the cost of an added (marginal) unit of output.

Sunk costs are those which are not altered by any change. They are the costs incurred in the past. This cost is the result of past decision, and cannot be changed by future decisions. Once an asset has been bought or an investment made, the funds locked up represent sunk costs. As these costs do not alter when any change in activity is made they are sunk and are irrelevant to a decision being taken now. Investments in fixed assets are examples of sunk costs. As soon as fixed assets have been installed, their cost is sunk. The amount of cost cannot be changed.

Incremental cost helps management to evaluate the alternatives. Incremental cost will be different in the case of different alternatives. Sunk cost, on the other hand, will remain the same irrespective of the alternative selected. Cost estimates of an incremental nature only influence business decisions.

Explicit and Implicit or Imputed costs

Explicit costs are those expenses that involve cash payments. These are the actual or business costs that appear in the books of accounts. Explicit cost is the payment made by the employer for those factors of production hired by him from outside. These costs include wages and salaries paid payments for raw materials, interest on borrowed capital funds, rent on hired land, taxes paid to the government etc. Implicit costs are the costs of the factor units that are owned by the employer himself. It does not involve dash payment and hence does not appear in the books of accounts. These costs did not actually incur but would have incurred in the absence of employment of self-owned factors of production. The two normal implicit costs are depreciation and return on capital contributed by shareholders. In small scale business unit the entrepreneur himself acts as the manager of the business. If he were employed in another firm he would be given salary. The salary he has thus forgone is the opportunity cost of his services utilised in his own firm. This is an implicit

cost of his business. Thus implicit wages, implicit rent and implicit interest are the highest interest, rent and wages which self-owned capital, building and labour respectively can earn from their next best use. Implicit costs are not considered for finding out the loss or gains of the business, but help a lot in business decisions.

Replacement and Historical costs

These are the two methods of valuing assets for balance sheet purpose and to find out the cost figures from which profit can be arrived at; Historical cost is the original cost of an asset. Historical cost valuation shows the cost of an asset as the original price paid for the asset acquired in the past. Historical valuation is the basis for financial accounts. Replacement cost is the price that would have to be paid currently to replace the same asset. For example, the price of a machine at the time of purchase was Rs. 17,000 and the present price of the machine is Rs. 20,000. The original price Rs. 17,000 is the historical cost while Rs. 20,000 is the replacement cost. During periods of substantial change in the price level, historical valuation gives a poor projection of the future cost intended for managerial decision. Replacement cost is a relevant cost concept when financial statements have to be adjusted for inflation.

Controllable and Non-controllable costs

Controllable costs are the ones which can be regulated by the executive who is in charge of it. The concept of controllability of cost varies with levels of management. If a cost is uncontrollable at one level of management it may be controllable at some other level. Similarly the controllability of certain costs may be shared by two or more executives. For example, material cost, the price of which comes under the responsibility of the purchase executive whereas its usage comes under the responsibility of the production executive. Direct expenses like material, labour etc. are controllable costs.

Some costs are not directly identifiable with a process or product. They are apportioned to various processes or products in some proportion. This cost varies with the variation in the basis of allocation and is independent of the actions of the executive of that department. These apportioned costs are called uncontrollable costs.

Business and Full costs

A firm's business cost is the total money expenses recorded in the books of accounts. This includes the depreciation provided on plant and equipment. It is similar to the

actual or real cost. Full cost of a firm includes not only the business costs but also opportunity costs of the firm and normal profits. The firm's opportunity cost includes interest on self-owned capital, the salary forgone by the entrepreneur if he were, working in his firm. Normal profit is the minimum returns which induces the entrepreneur to produce the same product.

Economic and Accounting Cost

Accounting costs are recorded with the intention of preparing the balance sheet and profit and loss statements which are intended for the legal, financial and tax purposes of the company. The accounting concept is a historical concept. It records what has happened. The past cost data revealed by the books of accounts does not help very much in decision- making. Decision- making needs future costs. Economic concept considers future costs and future revenues which help future planning and choice. When the accountant describes what has happened, the economist aims at projecting what will happen. Accounting data ignores implicit. or imputed cost. The economist considers decision-making costs. For this, different cost classifications relevant to different kinds of problems are considered. The cost distinctions such as opportunity and outlay cost, short- run and long-run cost and replacement and historical cost are made from the economic viewpoint.

Cost-Output Relations

The cost-output relationship plays an important role in determining the optimum level of production. Knowledge of the cost-output relation helps the manager in cost control, profit prediction, pricing, promotion etc. The relation between cost and output is technically described as the cost function.

TC = $\phi(Q)$

Where

TC = Total cost

Q =Quantity produced

F = function

The production function combined with the prices of inputs determines the cost function of the firm. Considering the period the cost function can be classified as (a)

short-run cost function and (b) long run-cost function.

In economic theory, the short-run is defined as that period during which the

physical capacity of the firm is fixed, and during which output can be increased only by using the existing capacity more intensively. The long-run is a period during which it is possible to increase the firm's capacity or to reduce it in size, if trade is very bad.

Short-run Cost-Output Relation

The cost concepts made use of in the cost behavior are total cost, average cost and marginal cost. Total cost if the actual money spent to produce a particular quantity of output. It is the summation of fixed and variable costs.

$$TC = TFC + TVC$$

Upto a certain level of production total fixed cost, i.e. the cost of plant, building, equipment etc. remains fixed. But the total variable costs i.e., the cost of labour, raw materials etc. vary with the variation in output

$$AC = {}^{TC}/_{Q}$$

Or it is the total of average fixed cost (TFC / Q) and average variable cost (TVC/Q) Marginal cost is the addition to the total cost due to the production of an additional unit of product. Or it is the cost of the marginal unit produced. It can be arrived at by dividing the change in total cost by the change in total output.

$$MC = {}^{TC}/_{Q}$$

In the short-run there will not be any change in total fixed cost. Hence change in total cost implies change in total variable cost only.

Short-run Cost-Output Relations

Table represents the cost-output relation. The table is prepared on the basis of the Law of Diminishing Marginal Returns. The fixed cost Rs.60 may include rent of factory building, interest on capital, salaries of permanently employed staff, insurance etc. These fixed costs are independent of output, whose amount cannot be altered in the short- run. But the average fixed cost, i.e. the fixed cost per unit, falls continuously as the out put increase.

The greater the out put, lower the fixed cost per unit. The total variable cost (TVC) increases but not at the same rate. If more and more units are produced with a given physical capacity AVC will fall initially. AVC declines upto 3rd unit, it is constant upto 4th unit and then rises. This is because the efficiency first increases and then decreases. The variable factors seem to produce somewhat more efficiently near a firm's optimum capacity

output level than at very low levels of output. But once the optimum capacity is reached, any further increase in output will increase AVC.

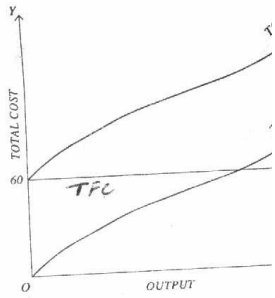


Fig. 1

The average total cost (AC) declines first and then rises. The rise in AC is felt only after the AVC starts rising. In the table AVC starts rising from the 5th unit onwards whereas the AC starts rising from the 6th unit only. AFC continues to fall with increase in output. But AVC initially declines and then rises. Thus there will be a stage where the AVC may have started rising, yet AC is still declining because the rise in AVC is less than the drop in AFC, the net effect being a decline in AC. Thus the table A shows an increasing returns or diminishing cost in the first instance and eventually diminishing returns or increasing cost.

The short-run cost-output relationship can be shown graphically also. Fig.1 shows the relationship between output and total fixed cost, total variable cost and total cost. TFC curve is a horizontal straight line representing Rs.60, whatever be the output TVC curve slopes upward starting from zero, first gradually but later at a fast rate. TC = TFC+TVC. As TFC remains constant, increase in TC means increase in TVC only. As TFC remains constant the gap between TVC and TC will always be the same. Hence TC curve has the

same pattern of behaviour as TVC curve.

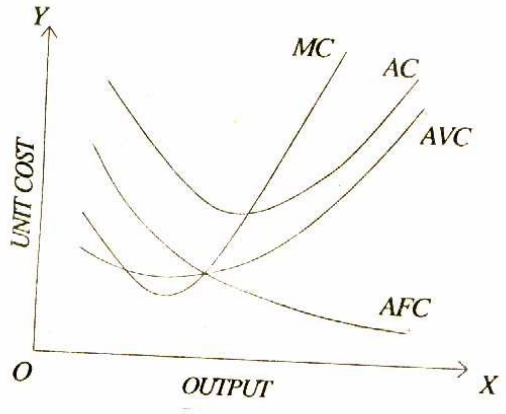


Fig. 2

Fig.2 shows the law of production more clearly. AFC curve continues to fall as output rises from lower levels to higher levels. This is because the total fixed cost is spread over more and more units as output increases. TVC increases with the increase in production since more raw materials, labour, power etc. would be required for increasing output. But AVC curve (i.e.variable cost per unit) first falls and then rises. This is due to the operation of the law of variable proportions.

The behaviour of AC curve depends upon the behaviour of AVC curve and AFC curve. In the initial stage of production both AFC and AVC are declining. Hence AC also declines. AFC continues to fall with an increase in output while AVC first declines and then rises. So long as AFC and AVC decline AC will also decline. But after a certain point AVC starts rising. If the rise in AVC is less than the decline in AFC, AC will still continue to decline. When the rise in AVC is more than the drop in AFC, AC begins to rise. In the table we can see that when the production is increased to 5 units AVC increases but AC still declines. Here the increase in AVC is less than the decline in AFC, the net effect being a decline in AC. AC curve, thus declines first and then rises.

At first AC is high due to large fixed cost. As output increases the total fixed cost is shared by more and more units and hence AC falls. After a certain point, owing to the operation of the law of diminishing marginal returns, the variable cost and, therefore, AC starts increasing. The lower end of AC curve thus turns up. and gives it a U-shape.

That is why AC curves are U-shaped. The least-cost combination of inputs is

indicated by the lowest point in Ac curve i.e. where where the total average cost is the minimum. It is the short-run stage of optimum output. It may not be the maximum output level. It is the point where the per unit cost of production will be at its lowest. A downward trend in MC curve shows increasing marginal productivity (i.e.decreasing marginal cost) of the variable input. Similarly, an upward trend in MC curve shows the rate of increase in TVC, on the one hand and the decreasing marginal productivity (i.e. increasing marginal cost) of the variable input on the other. MC curve intersects both AVC and AC curves at their lowest points.

The relationship between AVC, ATC and AFC can be summed up as follows:

1. If both AFC and AVC fall, AC will also fall because AC=AFC+AVC
2. When AFC falls and AVC rises(a) AC will fall where the drop in AFC is more than the rise in AVC (b) AC remains constant if the drop in AFC=rise in AVC (c) AC will rise where the drop in AFC is less than the rise in AVC.

Long-Run Cost-Output Relations

Long-run is a period long enough to make all inputs variable. In the long-run a firm can increase or decrease its output according to its demand, by having more or less of all the factors of production. The firms are able to expand the scale of their operation in the long-run by purchasing larger quantities of all the inputs. Thus in the long-run all factors become variable. The long-run cost -output relations therefore imply the relationship between total costs and total output. As the change in production in the long- run is possible by changing the scale of production, the long-run cost-output relationship is influenced by the law of returns to scale.

In the long-run a firm has a number of alternatives in regard to the scale of operations. For each scale of production or plant size, the firm has a separate short-run average cost curve. Hence the long-run average cost curve is composed of a series of short-run average cost curves.

A short-run average cost (SAC) curve applies to only one plant whereas the long-run average cost (LAC) curve takes into consideration many plants. At any one time the firm has only one size of plant. That plant remains fixed during that period. Any increase in production in that period is possible only with that plant capacity. That plant has a corresponding average cost (SAC) curve. But in a long period the firm can move from one

plant size to another. Each plant has its corresponding SAC curve.

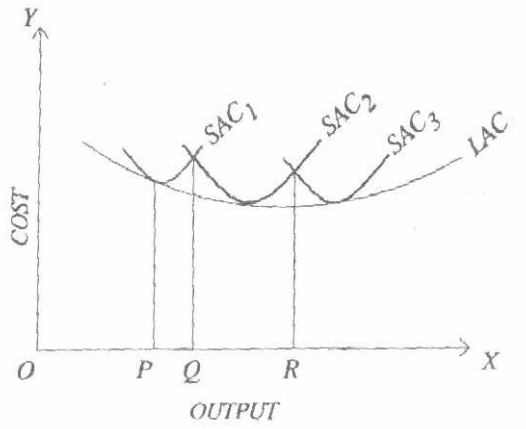


Fig. 3

The long-run cost-output relationship is shown graphically by the LAC curve. To draw an LAC curve we have to start with a number of SAC curves. In the fig. 5.3 we have assumed that there are only three sizes of plants-small, medium and large, S ACj refers to the average cost curve for the small plant, S AC, for the medium size plant and SAC3 for the large size plant. If the firm wants to produce OP units or less, it will choose the small plant. For an output beyond OQ the firm will opt for medium size plant.

Even if an increased production is possible with small plant production beyond OQ will increase cost of production per unit. For an output OR the firm will choose the large plant. Thus in the long-run the firm has a series of SAC curves. The LAC curve drawn will be tangential to the three SAC curves i.e. the LAC curve touches each SAC curve at one point. The LAC curve is also known as Envelope Curve as it envelopes all the SAC curves. No point on any of the LAC curve can ever be below the LAC curve. It is also known as Planning Curve as it serves as a guide to the entrepreneur

In his planning the size of plant for future expansion. The plant which yields the lowest average cost of production will be selected. LAC can, therefore, be defined as the lowest possible average cost of producing any output, when the management has adequate I time to make all desirable changes and adjustments.

In the long-run the demand curve of the firm depends on the law of returns to scale. The law of returns to scale states that if a firm increases the quantity of all inputs simultaneously and proportionately, the total output initially increases more than proportionately but eventually increases less than proportionately. It implies that when

production increases, per unit cost first' decreases but ultimately increases. This means LAC curve falls initially and rises subsequently. Like SAC curve LAC curve also is U-shaped, but it will be always flatter then SAC curves. The U-shape implies lower and lower average cost in the beginning until the optimum scale of the firm is reached and successively higher average cost thereafter.

The increasing return is experienced on account of the economies of scale or advantages of large-scale production Increase in scale makes possible increased division and _pecialization of labour and more efficient use of machines. After a certain point increase in production makes management more difficult and less efficient resulting in less than proportionate increase in output.

Long-run Marginal Cost Curve

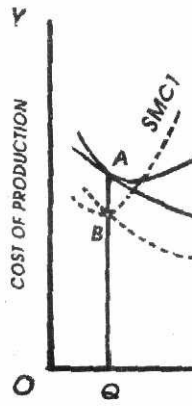


Fig. 4

Fig. 4

The long-run marginal cost curve represents the cost of an additional unit of output when all the inputs vary. The long-run marginal cost curve (LMC) is derived from the short-run marginal cost (SMC) curves. LMC curve intersects LAC curve at its minimum point C. There is only one plant size whose minimum SAC coincides with the minimum LAC and LMC.

$$SAC_2 = SMC_2 = LAC = LMC$$

The point C indicates also the optimum scale of production of the firm in the long-run or optimum output. Optimum output level is the level of production at which the cost of production per unit, i.e. AC, is the lowest. The optimum level is not the maximum

profit level. The optimum point is where AC=MC. Here C is the optimum point.

PRODUCTION ANALYSIS

Production is an important economic activity. It directly or indirectly satisfies the wants and needs of the people. Satisfaction of human wants is the objective of production. In this lesson a general discussion of the concept of production and its functions are carried out.

Production is the conversion of input into output. The factors of production and all other things which the producer buys to carry out production are called input. The goods and services produced are known as output. Thus production is the activity that creates or adds utility and value. In the words of Fraser, "If consuming means extracting utility from matter, producing means creating utility into matter". According to Edwood Buffa, “Production is a process by which goods and services are created"

Factors of Production

As already stated, production is a process of transformation of factors of production (input) into goods and services (output). The factors of production may be defined as resources which help the firms to produce goods or services. In other words, the resources required to produce a given product are called factors of production. Production is done by combining the various factors of production. Land, labour, capital and organisation (or entrepreneurship) are the factors of production (according to Marshall). We can use the word CELL to help us remember the four factors of production: C. capital; Entrepreneurship; L land: and L labour.

Characteristics of Factors of Production

1. The ownership of the factors of production is vested in the households.

2. There is a basic distinction between factors of production and factor services. It is these factor services, which are combined in the process of production.

3. The different units of a factor of production are not homogeneous. For example, different plots of land have different level of fertility. Similarly labourers differ in

efficiency.

4. Factors of production are complementary. This means their co-operation or combination is necessary for production.
5. There is some degree of substitutability between factors of production. For example, labour can be substituted for capital to a certain extent.

Basic Concepts in Production Theory

The firm is an organisation that combines and organises labour, capital and land or raw materials for the purpose of producing goods and services for sale. The aim of the firm is to maximise total profits or achieve some other related aim, such as maximising sales or growth. The basic production decision facing the firm is how much of the commodity or services to produce and how much labour, capital and other resources or inputs to use to produce that output most efficiently. To answer these questions, the firm requires engineering or technological data on production possibilities (the so called production function) as well as economic data on input and output prices.

Production refers to the transformation of inputs or resources into outputs of goods and services. For example: IBM hires workers to use machinery, parts and raw materials in factories to produce personal computers. The output of a firm can either be a final commodity (such as personal computer) or an intermediate product such as semiconductors (which are used in the production of computers and other goods). The output can also be a service rather than a good. Examples of services are education, medicine, banking, communication, transportation and many others. To be noted is, that production refers to all of the activities involved in the production of goods and services, from borrowing to set up or expand production facilities, to hiring workers, purchasing raw materials, running quality control, cost accounting and so on, rather than referring merely to the physical transformation of inputs into outputs of goods and services.

Inputs are the resources used in the production of goods and services. As a convenient way to organise the discussion, inputs are classified into labour. (Including entrepreneurial talent), capital and land or natural resources. Each of these broad categories however includes a great variety of the basic input. For example, labour includes bus drivers, assembly line workers, accountants, lawyers, doctors scientists and many others. Inputs are also classified as fixed or variable. Fixed inputs are those that can not be readily changed during the time period under consideration, except at

very great expense. Examples of fixed inputs are the firm's plant and specialised equipment. On the other land, variable inputs are those that can be varied easily and on the very short notice. Examples of variable inputs are most raw materials and unskilled labour.

The time period during which at least one input is fixed is called the short run, while the time period when all inputs are variable is called the long run. The length of the long run depends on the industry. For some, such as the setting up or expansion of a dry cleaning business, the long run may be only few months or weeks.

For others, much as the construction of new electricity, generating plant, it may be many years. In the short run, a firm can increase output only by using more of the variable inputs together with the fixed inputs. In the long run, the same increase in output could very likely be obtained more efficiently by also expanding the firm's production facilities. Thus we say that the firm operates in the short run and plans increases or reductions in its scale of operation in the long run. In the long run, technology usually improves, so that more output can be obtained from a given quantity of inputs or the same output from less input.

Production Function

Production is the process by which inputs are transformed in to outputs. Thus there is relation between input and output. The functional relationship between input and output is known as production function. The production function states the maximum

quantity of output which can be produced from any selected combination of inputs. In other words, it states the minimum quantities of input that are necessary to produce a given quantity of output.

The production function is largely determined by the level of technology. The production function varies with the changes in technology. Whenever technology improves, a new production function comes into existence. Therefore, in the modern times the output depends not only on traditional factors of production but also on the level of technology.

The production function can be expressed in an equation in which the output is the dependent variable and inputs are the independent variables. The equation is

expressed as follows:

Q= f (L, K, T……n)

Where, Q = output

L = labour

K = capital

T = level of technology

n = other inputs employed in production.

There are two types of production function - short run production function and long run production function. In the short run production function the quantity of only one input varies while all other inputs remain constant. In the long run production function all inputs are variable.

Assumptions of Production Function

The production function is based on the following assumptions.

1. The level of technology remains constant.
2. The firm uses its inputs at maximum level of efficiency.
3. It relates to a particular unit of time.
4. A change in any of the variable factors produces a corresponding change in the output.
5. The inputs are divisible into most viable units.

Managerial Use of Production Function

The production function is of great help to a manager or business economist. The managerial uses of production function are outlined as below:

1. It helps to determine least cost factor combination:

The production function is a guide to the entrepreneur to determine the least cost factor combination. Profit can be maximized only by minimizing the cost of production. In

order to minimize the cost of production, inputs are to be substituted. The production function helps in substituting the inputs.

2. It helps to determine optimum level of output:

The production function helps to determine the optimum level of output from a given quantity of input. In other words, it helps to arrive at the producer's equilibrium.

3. It enables to plan the production:

The production function helps the entrepreneur (or management) to plan the production.

4. It helps in decision-making :

Production function is very useful to the management to take decisions regarding cost and output. It also helps in cost control and cost reduction. In short, production function helps both in the short run and long run decision- making process.

Cobb Douglas Production Function

Paul H. Douglas and C.W Cobb of the U.S.A have studied the production of the American manufacturing industries and they formulated a statistical production function. It is popularly known as Cobb-Douglas Production Function. It is stated as follows.

Q = KLaC,,a) where, Q = output

L = quantity of labour

C = quantity of capital

K and a = positive constants

In this production function the output (Q) is a function of two inputs L and C. According to Cobb Douglas production function, about 3/4 of the increase in output is due to labour and the remaining 1/4 is due to capital. An important point in Cobb Douglas production function is that it indicates constant returns to scale. This means that if each input factor is increased by one percent, output will exactly increase by one percent. In other words, there will be no economies or diseconomies of scale.

Although the Cobb Douglas production function is nonlinear, it can be transformed into a linear function by converting all variables into logarithms. That is why this function is known as a log linear function. In 1937, David Duerentt suggested that it will be better to present Cobb-Douglas production function in the form of following equation :

$$Q = KL^a C^j$$

In the above equation, 'a' and 'j' stand for elasticity of production of labour and capital respectively.

Importance of Cobb-Douglas Production Function

Cobb-Douglas production function is most commonly used function in the field of economics. It graduates data on output and input well. Many economists used it independently. Hence, there are a number of varieties of the Cobb-Douglas form which yield variable elasticity's of production and substitution. It is useful in international or inter- industry comparisons. Cobb-Dougla's research has been a test of the marginal productivity theory of wages (or theory of distribution) as well as descriptions of production technology.

LAWS OF PRODUCTION

Production function shows the relationship between input and output. The law of production shows the relationship between additional input and additional output. The laws of production consists of - **(1) Law of Diminishing Returns** (to analyse production in the short period), and **(2) Laws of Returns to Scale** (to analyse production in the long period).

Law of Diminishing Returns or Law of Variable Proportion

The law of variable proportion is the modern approach to the 'Law of Diminishing Returns (or The Laws of Returns). This law was first explained by Sir. Edward West (French economist). Adam Smith, Ricardo and Malthus (Classical economists) associated this law with agriculture. This law was the foundation of Recardian Theory of Rent and Malthusian theory of population.

The law of variable proportion shows the production function with one input factor variable while keeping the other input factors constant. The law of variable proportion states that, if one factor is used more and more (variable), keeping the other factors constant, the total output will increase at an increasing rate in the beginning and then at a diminishing rate and eventually decreases absolutely.

According to K. E. Boulding, "As we increase the quantity of any one input which is combined with a fixed quantity of the other inputs, the marginal physical productivity of the variable input must eventually decline". In this law we study the effect of variations in factor proportion on output. When one factor varies, the others fixed, the proportion between the fixed factor and the variable factor will vary, (e.g., land and capital will be fixed in the short run, while labour will be variable).That is why the law is called the law of variable

proportion.

The law of variable proportion is also known as the law of proportionality, the law of diminishing returns, law of non-proportional outputs etc.

The following table illustrates the operations of Law of Variable Proportion.

Table - 2

No. Of workers (Variable Input factor)	Total Product (TP)	Average Product (AP)	Marginal Product (MP)	Remarks
1	10	10	10	I Stage
2	24	12	14	
3	39	13	15	
4	56	14	17	
5	70	14	14	II Stage
6	78	13	8	
7	84	12	6	
8	84	10.5	0	
9	81	9	-3	III Stage

In the above table we can see that both the average and marginal products increase at first and then decline. Average product is the product for one unit of labour. It is calculated by dividing the total product by the number of workers. Marginal product is the additional product resulting from additional labour. The total product increases at an increasing rate till the employment of the 4th worker. Beyond the 4th worker, the marginal product is diminishing. The marginal product declines faster than the average product.

When 7 workers are employed, the total product is maximum. For 8 workers marginal product is zero and the marginal product of 9 workers is negative. Thus when more and more units labour are combined with other fixed factors, the total product increases first at an increasing rate, then at a diminishing rate and finally it becomes negative.

The above idea can be more clearly illustrated with the help of a diagram (Fig.5).

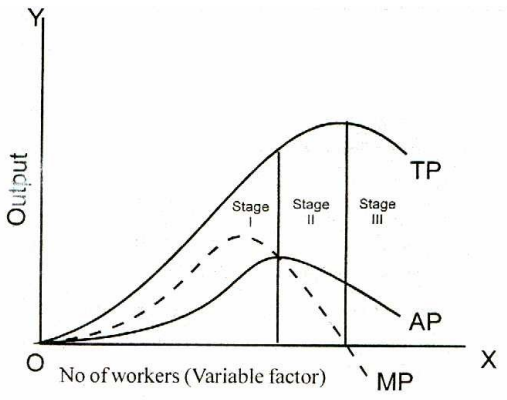


Fig. 5

When one input is variable and others are held constant, the relations between the input and the output are divided into three stages. The law of variable proportion may be explained under the following three stages as shown in the graph:

Stage 1: Total product increases at an increasing rate and this continues till the end of this stage. Average product also increases and reaches its highest point at the end of this stage. Marginal product increases at an increasing rate. Thus TP, AP and MP - all are increasing. Hence this stage is known as stage of increasing return.

Stage II: Total product continues to increase at a diminishing rate until it reaches its maximum point at the end of this stage. Both AP and MP diminish, but are positive. At the end of the second stage, MP becomes zero. MP is zero when the TP is at the maximum. AP shows a steady decline throughout this stage. As both AP and MP decline, this stage is known as stage of diminishing return.

Stage III: In this stage the TP declines. AP shows a steady decline, but never becomes zero. MP becomes negative. It goes below the X axis. Hence the 3rd stage is known as stage of negative return.

According to classical economists there were three laws of returns: (i) Law of increasing returns, (ii) Law of constant returns, and (iii) Law of diminishing returns. But the modern economists do not accept this. According to them there are not three laws of production but there is only one law of production i.e. law of variable proportion. It has three stages. It is necessary to understand the following terms:

Total Product or Total Physical Product (TPP): This is the quantity of output a firm obtains in total from a given quantity of input.

Average Product or Average Physical Product (APP): This is the total physical product (TPP) divided by the quantity of input.

Marginal Product or Marginal Physical Product (MPP): It is the increase in total output that results from a one unit increase in the input, keeping all other inputs constant.

Assumptions of the Law

The law of variable proportion is valid when the following conditions are fulfilled:

1. The technology remains constant. If there is an improvement in the technology, due to inventions, the average and marginal product will increase instead of decreasing.
2. Only one input factor is variable and other factor are kept constant.
3. All the units of the variable factors are identical. They are of the same size and quality.
4. A particular product can be produced under varying proportions of the input combinations.
5. The law operates in the short run.

Why does the Law of Variable Proportions operate?

The law of variable proportion operates on account of the following reasons:

1.**Imperfect substitutes:** There is a limit to the extent to which one factor can be substituted for another. In other words, two factors are not perfect substitutes. For example, in the construction of building, capital cannot substitute labour fully.

2.**Scarcity of the factors of production:** Output can be increased only by increasing the variable factors. In the short run certain input factors like land and capital are scarce. This leads to diminishing marginal productivity of the variable factors.

3.**Economies and diseconomies of scale:** The internal and external economies of large scale production are available as production is expanded. Therefore average cost goes on diminishing. But this continues only up to a certain stage. When the production is expanded beyond a level the diseconomies will start entering into production. Hence the output will come down (or cost will go up).

4.**Specialisation :** The stage of diminishing returns comes into operation when the limit to

maximum degree of specialisation reaches. This stage emerges when the fixed factor becomes more and more scarce in relation to the variable factor thereby giving less and less support to the latter. As a result of this, the efficiency and productivity of the variable factor diminish.

Importance of the Law of Variable Proportion

The law of variable proportion is one of the most fundamental laws of Economics. The law of variable proportion is applicable not only to agriculture but also to other constructive industries like mining, fishing etc. It is applied to secondary or tertiary sectors too. This law helps the management in the process of decision making. The law is a law of life and can be applicable anywhere and everywhere. The applications of this law are as follows:

Basis of Malthusian theory of population: Malthus based his theory of population on the law of variable proportion.

1.**Basis of the Ricardian theory of rent**: Ricardo's theory of rent is based on this law.

2.**Basis of the marginal productivity theory of distribution:** The marginal productivity theory of distribution is also based on this law.

3.**Optimum production**: This law can be used to estimate the optimum proportion of the factors for the producer.

4.**Price determination:** This law is also important in the price determination.

5.**Explanation of disguised unemployment**: Less developed countries like India have good deal of disguised unemployment. Many farm workers are in fact surplus. This is called disguised unemployment. The law helps us in explaining the presence of disguised unemployment. In short, the law of variable proportion is a universal law.

LAWS OF RETURNS TO SCALE

The law of variable proportion analyses the behaviour of output when one input factor is variable and the other factors are held constant. Thus it is a short run analysis. But in the long run all factors are variable. When all factors are changed in same proportion, the behaviour of output is analysed with laws of returns to scale. Thus law of returns to scale is a long run analysis.

In the long period, output can be increased by varying all the input Factors this

law is concerned, not with the proportions between the factors of production, but with the scale of production. The scale of production of the firm is determined by those input factors which cannot be changed in the short period. The term return to scale means the changes in output as all factors change in the same proportion. The law of returns to scale seeks to analyse the effects of scale on the level of output. If the firm increases the units of both factors labour and capital, its scale of production increases. The return to scale may be increasing, constant or diminishing. We shall now examine these three kinds of returns to scale.

Increasing Returns to Scale

When inputs are increased in a given proportion and output increases in a greater proportion, the returns to scale are said to be increasing. In other words, proportionate increase in all factors of production results in a more than proportionate increase in output It is a case of increasing returns to scale. For example, if the inputs are increased by 40% and output increased by 50%, return to scale are increasing (= >1). It is the first stage of production.

If the industry is enjoying increasing returns, then its marginal product increases. As the output expands, marginal costs come down. The price of the product also comes down.

Constant Return to Scale

When inputs are increased in a given proportion and output increases in the same proportion, constant return to scale is said to prevail. For example, if inputs are increased by 40% and output also increases by 40%, the return to scale are said to be constant (= 1). This may be called homogeneous production function of the first degree. In case of constant returns to scale the average output remains constant. Constant returns to scale operate when the economies of the large scale production balance with the diseconomies.

Decreasing Returns to Sale

Decreasing returns to scale is otherwise known as the law of diminishing returns. This is an important law of production. If the firm continues to expand beyond the stage of constant returns, the stage of diminishing returns to scale will start operate. A proportionate increase in all inputs results in less than proportionate increase in output, the returns to scale is said to be decreasing. For example, if inputs are increased by 40%, but output increases by only 30%, (= < 1), it is a case of decreasing return to scale.

Decreasing return to scale implies increasing costs to scale.

Production Function with Two Variable Inputs

So far we have assumed that the firm is increasing output either by using more of one input (in laws of return) or more of all inputs (in laws of returns to scale). Let us now consider the case when the firm is expanding production by using more of two inputs (varying) that are substitutes for each other. A production function with two variable inputs can be represented by isoquants. Isoquant is a combination of two terms, namely, iso and quant. Iso means equal. Quant means quantity. Thus isoquant means equal quantity or equal product. Isoquants are the curves which represent the different combination of inputs producing a particular quantity of output. Any point on the isoquant represents or yields the same level of output.

Thus isoquant shows all possible combinations of the two inputs (say labour and capital) capable of producing equal or a given level of output. Isoquants are also known as iso product curves or equal product curves or production indifferent curves. An isoquant may be explained with the following example:

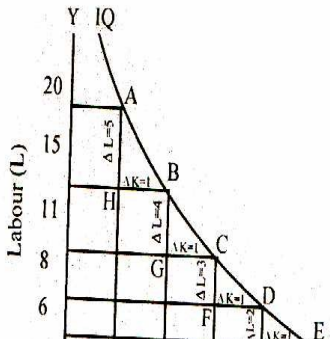
Equal Product Combinations: Table. 3

Combination	Units of labour	Units of Capital	Total Output
A	20	1	1000
B	15	2	1000
C	11	3	1000
D	8	4	1000
E	6	5	1000

In the above schedule, there are five possible combinations. All the five combinations yield the same level of output i.e. 1000 units. 20 units of labour and 1 unit of capital produce 1000 units. 15 units of labour and 2 units of capital also produce 1000 units and so on. All combination are equally likely because all of them produce the same level of output i.e. 1000 units. Now if plot these combination of labour and capital, we shall get a curve. This curve is known as an isoquant.

In the below diagram units of capital are measured on horizontal axis and units of labour on vertical axis. The five combinations are known as A, B, C, D and E. After joining these points, we get the iso product curve IQ. Here we assume that the level of technology remains constant. We also assume that the input can be substituted for each other. If quantity of labour is reduced, the quantity of capital must be increased to produce the same output. Thus an isoquant shows various combinations of the two inputs in the existing state of technology which produce the same level of output.

Fig. 6



Diminishing Marginal rate of Technical Substitution

As already stated, an important assumption in the isoquant diagram is that the inputs can be substituted for each other. If a unit of labour is reduced, the units of capital must be increased in order to produce the same output. Here we want to know the rate at which one factor is substituted for the other. The term marginal rate of technical substitution refers to the rate at which one factor of production is substituted in place of the other factor, the quantity of output remaining the same.

It is the rate at which one input must be substituted for another, in order to keep the same level of output. Thus the marginal rate of technical substitution of capital for labour may be defined the units of labour which can be replaced by one unit of capital; keeping the same level of output. In other words, it is the ratio of small decrease in the amount of labour and a small increase in the amount of capital so as to keep the same level of output.

The ratio of AL/AK is called the marginal rate of technical substitution of capital for labour. AL refers to changes in the units of labour and AK refers to change in the units of capital. In Fig.6 on the 1Q for one thousands units have the segments like the following,

1000 units the $MRTS_{KL}$ over AB segment $\frac{AH}{HB} = \frac{AL}{AK} = \frac{5}{1}$ Over the segment BC is $\frac{BG}{GC} = \frac{1}{4}$ and so on. In short, the marginal rate of technical substitution of $\frac{AL}{AK}$ measures the slope of the isoquant at a particular point. For example, the slope of the isoquant at point A $\frac{AL}{AK} = \frac{5}{1}$ where as at B $\frac{AL}{AK} = \frac{4}{1}$ it is Thus the slope of an isoquant is

at a point represents marginal rate of technical substitution. It is also important to note that the marginal rate of technical substitution is the ratio of marginal productivity of labour to marginal productivity of capital.

As more and more units of capital are substituted to labour, each additional unit of capital contributes less and less output, while when labour is reduced each last unit of labour contributes more and more to output, because inefficient units of capital are coming to production while inefficient units of labour are going out of production.

Marginal productivity of capital will decrease and marginal productivity of labour willincrease. Thus when we move from left to right on an isoquant (substituting more capital

in place of $\frac{MFK}{MFL}$ diminish.
labour)

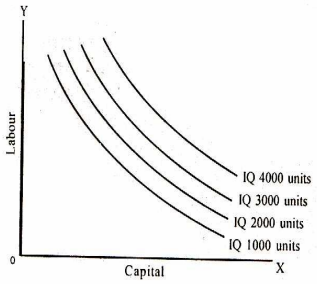
As more capital is used, marginal productivity of capital will get diminished. At the same time as the unit of labour is reduced, the marginal productivity of labour will increase. Hence the marginal rate of technical substitute of capital for labour diminishes so as to

maintain the same quantity. It is shown as follows:

$MRTS_{KL} = \frac{\Delta L}{\Delta K} = \frac{MFK}{MFL}$

Isoquant Map or Equal Product Map

An isoquant map consists of a number of isoquants. An isoquant map gives a set of equal product curves which show different production levels. Each isoquant in the map indicates different levels of output. A higher isoquant represents a higher level of output. The distance of an isoquant from the origin shows the relative levels of output. The farther the isoquant from the origin the greater will be the level of output along it. But it should be noted that the distance between two equal product curves does not measure the absolute difference in the volume of output. Isoquant map is shown in the following diagram.



Properties or Features of Isoquant

The following are the important properties of isoquants:

1. Isoquant is downward sloping to the right. This means that if more of one factor is used less of the other is needed for producing the same output.

2. A higher isoquant represents larger output.

3. No isoquants intersect or touch each other. If so it will mean that there will be a common point on the two curves. This further means that same amount of labour and capital can produce the two levels of output which is meaningless. The isoquant as shown in Fig.8 will never exist.

4. Isoquants need not be parallel to each other. It so happens because the rate of substitution in different isoquant schedules need not necessarily be equal. Usually they are found different and therefore, isoquants may not be parallel.

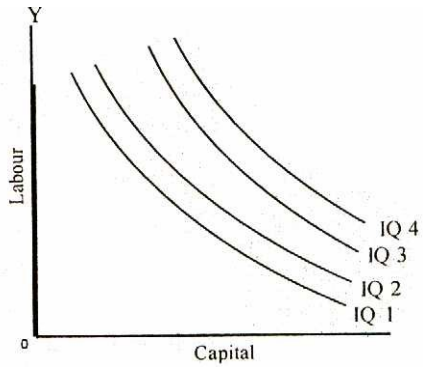


Fig. 9

5. Isoquant is convex to the origin. This implies that the slope of the isoquant diminishes from left to right along the curve. This is because of the operation of the principle of diminishing marginal rate of technical substitution.

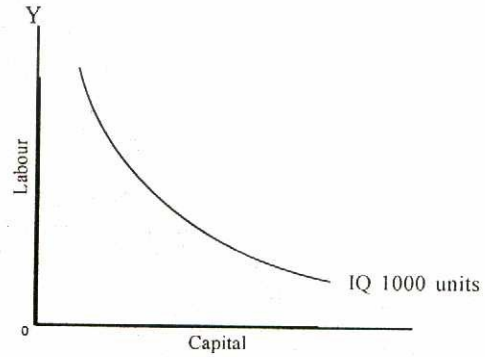


Fig.10

6. No isoquant can touch either axis. If an isoquant touches X axis then it would mean that without using any labour the firm can produce output with the help of capital alone. But this is wrong because the firm can produce nothing with OK units of capital alone. If

an isoquant touches Y axis, it would mean that without using any capital the firm can produce output with the help of labour alone. This is impossible.

7.Isoquants have negative slope. This is so because when the quantity of one factor (labour) is increased the quantity of other factor (capital) must be reduced, so that total output remains the same. If the marginal productivity of the factor becomes zero the isoquant will bend back and it will have positive slope as shown

below.

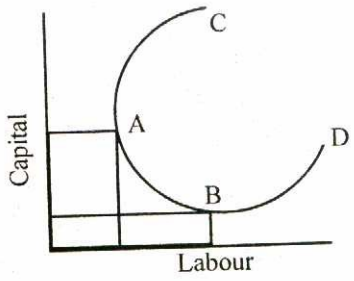
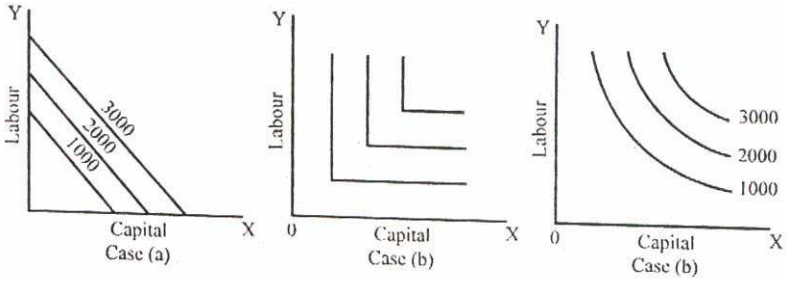


Fig.11

The portions AC and BD of the isoquant have positive slope.

If the inputs are perfect substitutes, each isoquant will be a straight line (case a). If

the inputs cannot be substituted at all, the isoquants will be right angles (case b). Typical isoquants lie between the extreme cases of straight lines and right angles (case c). Along a curved isoquant, the ability to substitute one input for another varies.



Optimum Input Combination (Least cost combination or Producer's Equilibrium)

The isoquant shows different combinations of two factors producing the same level of output. However, the producer will not accept all combinations. He wants to maximize his profit. It is possible only by maximising the output at minimum cost. Therefore, he will select the optimum input combination which involves the least cost. Optimum input combination or least cost combination is that combination which produces maximum output at the minimum cost. In other words, the optimum or least cost combination is that combination where the average cost of production is the minimum. This is the producer's equilibrium. This can be found out by combining the firm's production function and cost function.

The production function is represented by isoquant and cost function is represented by iso-cost curve.

The principle of least cost combination is based on the following assumptions:

1. Capital and labour are the two factors involved in production.
2. All the units of both the factors are homogeneous.
3. The prices of the input factors are given.
4. The total money outlay is also given.
5. There is perfect competition in the factor market.

In order to analyse producer's equilibrium the firm should combine its isoquant (already discussed) and iso-cost line.

Iso-cost Curve

In order to select the optimum quantity of two inputs, the firm has to consider their quantities and their prices. Factors of production are available at a price. Therefore their prices and amount of money which the firm wants to spend has to be taken into consideration. Isocost line represents these two things. An isocost line indicates the different combination of the two factors which the firm can buy at given prices with a given amount of money.

It shows all the combinations of labour and capital that the firm can purchase with a given outlay and at given prices. Thus isocost shows the prices of the two factors and the total amount of money to spend. To make it more clear, let us take an example. Suppose a firm deci to spend Rs.5000 on 2 factors - capital and labour. If the weekly wage of a worker is Rs.50, the firm can employ 100 workers. Similarly if one unit of capital costs Rs.20, the firm buy 250 units of capital. Thus the firm can spend the whole amount of Rs.5000 either on labour (100 workers) or on capital (250 units) or partly on labour and partly on capital. The isocost line is shown in the Fig. 12

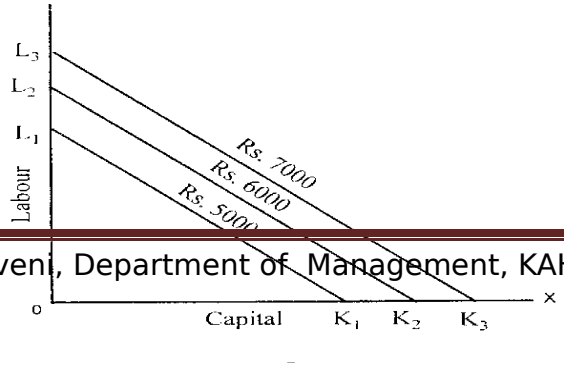


Fig. 12

The isocost line L, K, indicates on outlay of Rs.5000. With Rs.5000 the firm can buy either OL, units of labour or OK., units of capital or any combination of labour and capital between the extremes L(K.,. Similarly the isocost line L2 K... shows an outlay of Rs.6000 which means that either 120 workers may be employed or 300 units of capital

may be bought or some units of both capital and labour. Thus isocost line shows all those combinations of capital and labour which the firm can use with the given amount of money. An isocost curve represents the same cost for all the different combination of input. Isocost line is always a straight line (because the firm has no control over market prices of factors).

POSSIBLE QUESTIONS : - PART – B

1. What are the factors of production?
2. What is meant by Isoquant Curves?
3. List out the various types of costs?
4. What are the factors of production?
5. Define Isoquant Curves in production function?
6. List out the cost concepts?

7. Mention the factors of production?
8. What are the various types of Concepts?
9. Give the meaning of the term Cost Output relationship?
10. What are the various types of costs?
11. Write short note on Break -Even -Analysis?
12. Differentiate between Short - run cost and Long – run cost?
13. Mention the factors of production?
14. What are the various types of costs?
15. Give the meaning of the term Cost Analysis?

***CIA – 3 X 2 = 6 Marks**
****ESE – 5 X 2 = 10 Marks**

PART – C

1. Explain the Law of Diminishing Returns with suitable chart.
2. Determine the short run and long run cost of production?
3. Determine the cost output relationship in short and long period?
4. Explain the Assumptions and Significance of the Law of Diminishing Returns?
5. Define and explain the Law of Diminishing Returns with suitable diagramme.
6. Elucidate the term Cost Analysis?
7. What is cost of production? Indicate the approach of Economists and Accountants in deciding the cost of production?
8. Explain the Cost Concepts and Cost classifications?
9. Define the Law of Diminishing Returns and illustrate the concept?
10. What are the differences between short run and long run average costs?

***CIA – 3 X 8 = 24 Marks (EITHER OR TYPE)**
****ESE – 5 X 6 = 30 Marks (EITHER OR TYPE)**

Unit – III : Theory of Firm and Organization : Perfect Competition (Basic features, short run equilibrium of firm / industry, long run equilibrium of firm / industry, effect of changes in demand, cost and imposition of taxes) - Monopoly (Basic features, short run equilibrium of firm / industry, long run equilibrium of firm / industry, effect of changes in demand, cost and imposition of taxes, comparison with perfect competition, welfare cost of monopoly) – Price discrimination, multiplant monopoly ; Monopolistic Competition (Basic features, demand and cost, short run equilibrium, long run equilibrium, excess capacity) – Oligopoly (Cournot's model, kinked demand curve model, dominant price leadership model, prisoner's dilemma)

In ordinary language, the term market refers to a public place in which goods and services are bought and sold. In economics, it has a different meaning. Different economists have tried to define market in different ways. Cournot defines market as, "not any particular market place in which things are bought and sold, but the whole of any region in which buyers and sellers are in such free intercourse with each other that the prices of the same goods tend to equality easily and quickly".

To Ely, "Market means the general field within which the force determining the price of particular product operate". According to Benham," Market is any area over which buyers and sellers are in close touch with one another, either directly or through dealers, that the price obtainable in one part of the market affects the prices paid in other parts". Stonier and Hague explain the term market as "any organisation whereby buyers and sellers of a good are kept in close touch with each other". There is no need for a market to be in a single building.

The only essential for a market is that all buyers and sellers should be in constant touch with each other, either because they are in the same building or because they are able to talk to each other by telephone at a moment's notice.

Thus a market has the following basic components.

1. There should be buyers of the product. If a country consists of people who are very poor,

there can hardly be market for luxuries like cars, VCR etc.

2. A commodity should be offered for sale in the market. Otherwise there is no question of buying the commodity. Therefore, existence of sellers is a necessity for any market.

3. Buyers and sellers should have close contact with each other.

4. There should be a price for the commodity. The exchange of commodities between buyers and sellers occurs at a particular price which is mutually agreeable to both the buyers and sellers.

CLASSIFICATION OF MARKET

Market may be classified into different types:

On the basis of area

Markets may be classified on the basis of area into local, national and international markets. If the buyers and sellers are located in a particular locality, it is called as a local market, e.g. fruits, vegetables etc. These goods are perishable; they cannot be stored for a long time; they cannot be taken to distant places. When a commodity is demanded and supplied all over the country, national market is said to exist. When a commodity commands international market or buyers and sellers all over the world, it is called international market.

Whether a market will be local, national or international in character will depend upon the following factors: (a) nature of commodity; (b) taste and preference of the people; (c) availability of storage; (d) method of business; (e) political stability at home and abroad; if) portability of the commodity.

On the basis of time

Time element has been used by Marshall for classifying the market. On the basis of time, market has been classified into very short period, short period, long period and very long period. Very short period market refers to the market in which commodities that are fixed in supply or are perishable are transacted. Since supply is fixed, only the

changes in demand influence the price. The short period markets are those where supply can be increased but only to a limited extent. Long period market refers to a market where adequate time is available for changing the supply by changing the fixed factors of production. The supply of commodities may be increased by installing a new plant or machinery and the output can be changed accordingly. Very long period or secular period is one in which changes take place in factors like population, supply of capital and raw material etc.

On the basis of nature of transactions

Markets are classified on the basis of nature of transactions into two broad categories viz., Spot market and future market. When goods are physically transacted on the spot, the market is called as spot market. In case the transactions involve the agreements of future exchange of goods, such markets are known as future markets.

On the basis of volume of business

Based on the volume of business, markets are broadly classified into wholesale and retail markets. In the wholesale markets, goods are transacted in large quantities. Wholesale markets are in fact, a link between the producer and the retailer while the retailer is a link between the wholesaler and the consumer.

On the basis of status of sellers

During the process of marketing, a commodity passes through a chain of sellers and middlemen. Markets can be classified into primary, secondary and terminal markets. The primary market consists of manufacturers who produce and sell the product to the wholesalers. The wholesalers who are an international link between the manufacturers and retailers constitute secondary markets while the retailers who sell it to the ultimate consumer constitute the terminal market.

On the basis of regulation

On this basis, market is classified into regulated and unregulated markets. For some goods and services, the government stipulates certain conditions and regulations for their transactions. Market of goods and services is called regulated market. On the other

hand, goods and services whose transactions are left to the market forces belong to unregulated market. Regulations of market by the government become essential for those goods whose supply or price can be manipulated against the interests of the general public.

On the basis of competition

Markets are classified on the basis of nature of competition into perfect competition and imperfect competition.

PERFECT COMPETITION

The term market structure refers to the degree of competition prevailing in that particular market. For price analysis it is vital for business management to gain knowledge of the nature and process of competition in the prevailing business society.

Hence a thorough study on the different types of market structure is essential for the

determination of price. In this lesson we will confine our discussion to perfect competition. Perfect competition in economic theory has a meaning diametrically opposite to the everyday use of the term. In practice, businessmen use the word competition as synonymous to rivalry. In theory, perfect competition implies no rivalry among firms. Perfect competition, therefore, can be defined as a market structure characterised by a complete absence of rivalry among the individual firms.

FEATURES

1.Large number of buyers and sellers

There must be a large number of firms in the industry. Each individual firm supplies only

a small part of the total quantity offered in the market. As a result, no individual firm can influence the price. Similarly, the buyers are also numerous. Hence, no individual buyer has any influence on the market price. The price of the product is determined by the collective forces of industry demand and industry supply. The firm is only a 'price taker'. Each firm has to adjust its output or sale according to the prevailing market price.

2.Homogeneity of products

In a perfectly competitive industry, the product of any one firm is identical to the products of all other firms. The technical characteristics of the product as well as the services associated with its sale and delivery are identical.

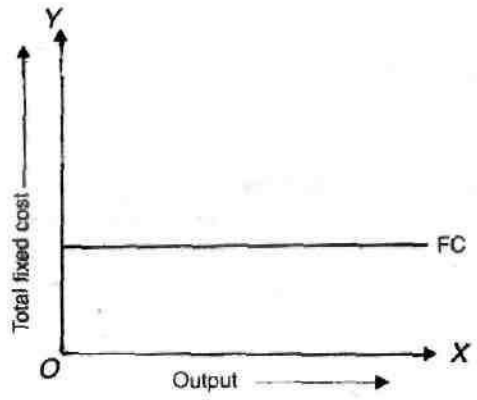


Fig. 1.

The demand curve of the individual firm is also its average revenue and its marginal revenue curve. The assumptions of large numbers of sellers and product homogeneity imply that the individual firm in pure competition is a price taker. Its demand curve is infinitely elastic indicating that the firm can sell any amount of output at the prevailing market price.

3. Free entry exit

There is no barrier to entry or exit from the industry. Entry or exit may take time but firms have freedom of movement in and out of the industry. If the industry earns abnormal profits, new firms will enter the industry and compete away the excess profits. Similarly, if the firms in the industry are incurring losses some of them will leave the industry which will reduce the supply of the industry and will thus raise the price and wipe away the losses.

4. Absence of government regulation

There is no government intervention in the form of tariffs, subsidies, relationship of production or demand. If these assumptions are fulfilled, it is called pure competition which

requires the fulfillment of some more condition.

1. **Perfect mobility of factors of production**

The factors of production are free to move from one firm to another throughout the economy. It is also assumed that workers can move between different jobs. Raw materials and other factors are not monopolised and labour is not unionised. In short, there is perfect competition in the factor market.

6.Perfect knowledge

It is assumed that all sellers and buyers have complete knowledge of the conditions of the market. This knowledge refers not only to the prevailing conditions in the current period but in all future periods as well. Information is free and costless. Under these conditions uncertainty about future developments in the market is ruled out.

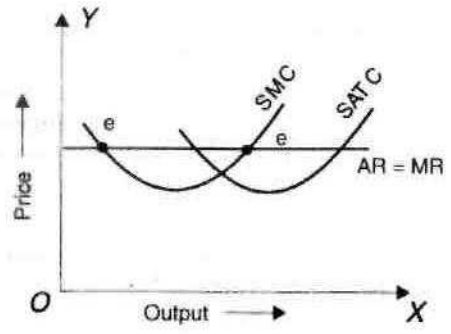
7. Absence of transport costs

In a perfectly competitive market, it is assumed that there are no transport costs.

SHORT RUN EQUILIBRIUM OF THE FIRM

The firm is in equilibrium at the point of intersection of the marginal cost and marginal revenue curves. The first condition for the equilibrium of the firm is that marginal cost should be equal to marginal revenue. The second condition for equilibrium requires that marginal cost curve should cut the marginal revenue curve from below.

Fig. 2



The firm is in equilibrium only at 'e' because only at 'e' both the conditions are satisfied. At 'e ' the firm is not in equilibrium as the second condition is not fulfilled. The fact that the firm is in equilibrium in the short run does not mean that it makes excess profits. Whether the firm makes excess profits or losses depends on the level of average total cost at the short run equilibrium.

In figure 3. (A), the SATC is below the price at equilibrium; the firm earns excess profits.

In figure 3. (B), the SATC is above the price; the firm makes a loss. In the short run a firm generally keeps on producing even when it is incurring losses. This is so because by producing and earning some revenue, the firm is able to cover a part of its fixed costs. So long as the firm covers up its variable cost plus at least a part of annual fixed cost, it is advisable for the firm to continue production.

It is only when it is unable to cover any portion of its fixed cost, it should stop producing. Such a situation is known as shut down point. The shut down point of the firm is denoted by W. If price falls below P the firm does not cover its variable costs and is better off if it closes down.

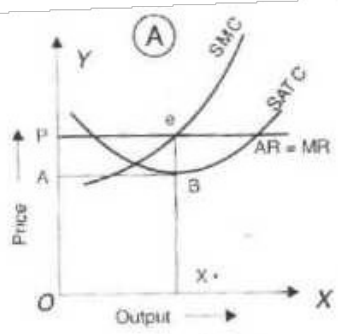


Fig. 3. (A)

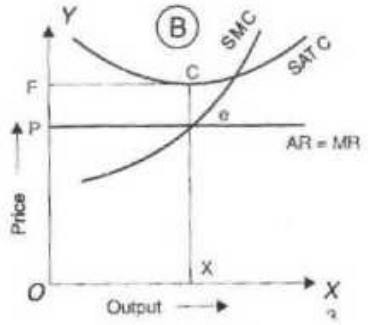


Fig. 3. (B)

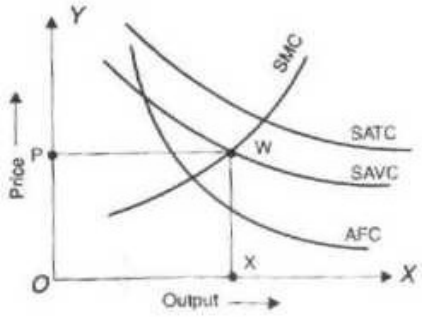


Fig. 4.

Short- runs Equilibrium of the industry.

Given the market demand and market supply, the industry is in equilibrium at the price at which the quantity demanded is equal to the quantity supplied.

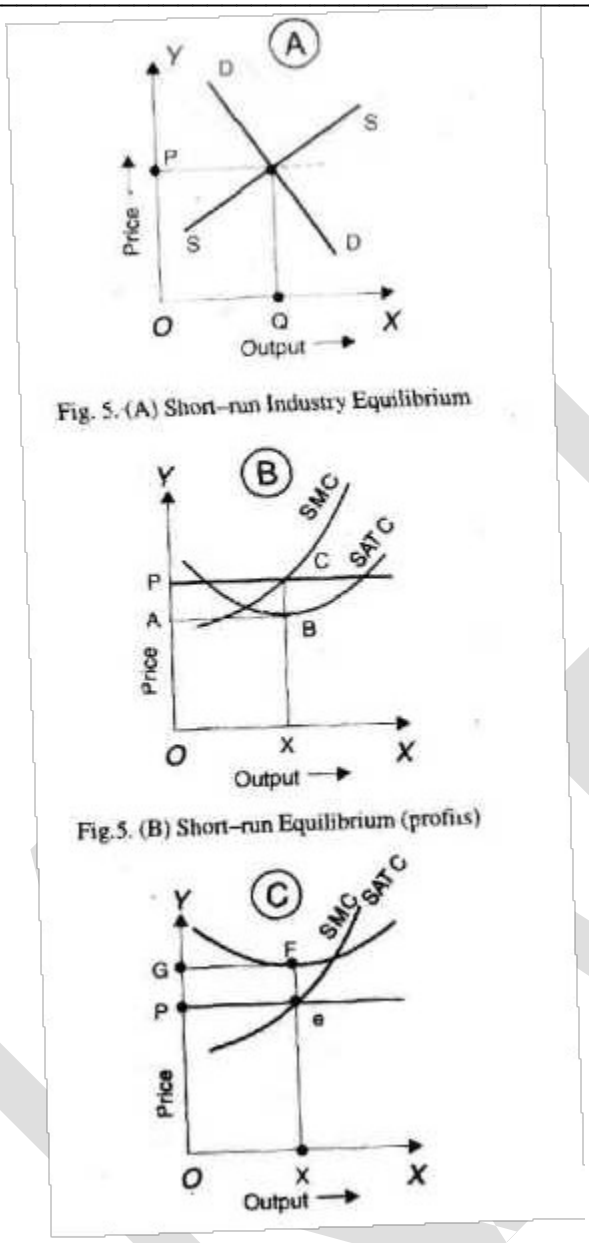


Fig. 5. (A) Short–run Industry Equilibrium

Fig.5. (B) Short–run Equilibrium (profits)

The industry is in equilibrium at price P at which the quantity demanded and supplied is OQ. However this will be a short-run equilibrium as some firms are earning abnormal profits and some incur losses as shown in figures 5. (B) and 5. (C) respectively.

In the long run, firms that make losses will close down. Those firms which make excess profits will expand and also attract new firms into the industry. Entry, exit and readjustment will lead to long run equilibrium in which firms will be earning normal profits and there will be no entry or exit from the industry.

Long-run equilibrium of the firm

In the long run firms are in equilibrium when they have adjusted their plant so as to produce at the minimum point of their long run AC curve, which is tangent to the demand curve. In the long run the firms will be earning just normal profits, which are included in the LAC. The long run equilibrium position of the firm is shown in figure 6.

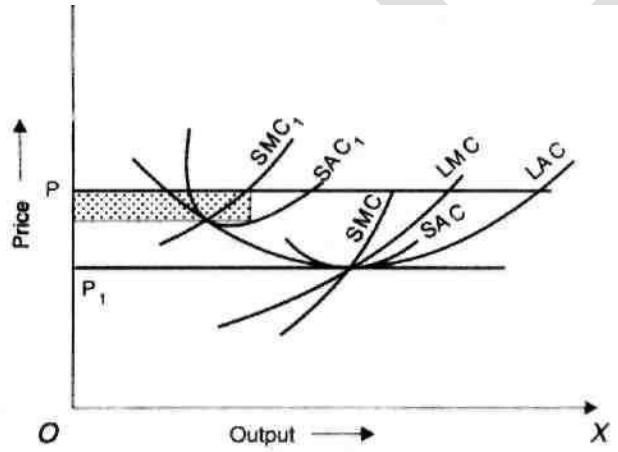


Fig. 6

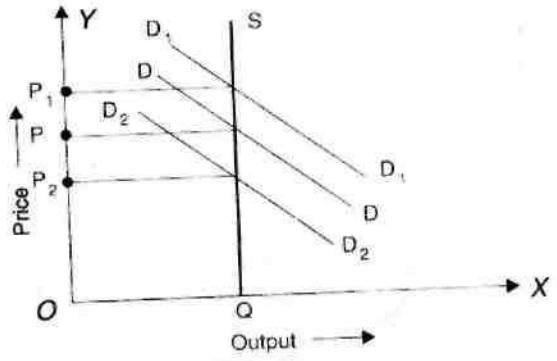
At the price of OP, the firm is making excess profits. Therefore, it will have an incentive to build new capacity and hence it will move along its LAC. At the same time, attracted by excess profits new firms will be entering the industry. As the quantity supplied increases, the price will fall to P_i at which the firm and the industry are in long- run equilibrium. The condition for the long-run equilibrium of the firm is that the marginal cost tie equal to the price and to the long run-average cost.

LMC = LAC = P

The firm adjusts its plant size so as to produce that level of output I which the LAC is the minimum. At equilibrium the short run marginal is equal to the long run marginal cost and the short run average cost is equal to the long run average cost. Thus, in equilibrium in the long SMC = LMC = LAC = SAC = P = MR. This implies that at the minimum point of the LAC the plant worked at its optimal capacity, so that the minimal of the LAC and SAC coincide.

Long-run Equilibrium of the Industry

The industry is in long run equilibrium when price is reach which all firms are in equilibrium producing at the minimum point oft LAC curve and making just normal profits. Under these conditions there is no further entry or exit of firms in the industry.
The long run equilibrium is shown in the figure. 7.



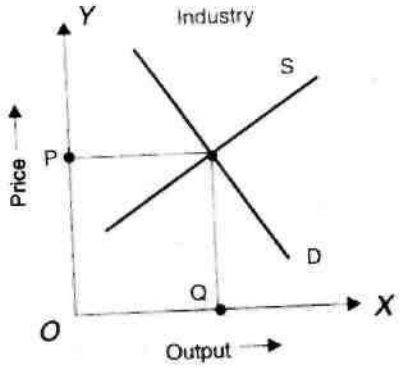


Fig. 7. Industry

At the market price P the firms produce at their minimum cost, earning just normal profits. The firm is in equilibrium because at the level of output x

LMC = SMC = P = MR

This equality ensures that the firm maximises its profit. At the price P the industry is in equilibrium because profits are normal and all costs are covered so that there is no incentive for entry or exit.

Price determination under perfect competition-Role of time

Price of a commodity in an industry is determined at that point where industry demand is equal to industry supply. Marshall laid emphasis on the role of time element in the determination of price. He distinguished three periods in which equilibrium between demand and supply was brought about viz., very short period or market period; short run equilibrium

and long run equilibrium.

Market period

Price is determined by the equilibrium between demand and supply in market period. In the market period, the supply of commodity is fixed. The firms can sell only what they have already produced. This market period may be an hour, a day or few days or even few weeks depending upon the nature of the product. So far as the supply curve in a market period is concerned, two cases are prominent-one is that of perishable goods and the other is that of non perishable durable goods.

For perishable goods like fish, vegetables etc. the supply is given and cannot be kept for the next period; therefore, the whole of it must be sold away on the same day whatever be the price. The supply curve will be a vertical straight line.

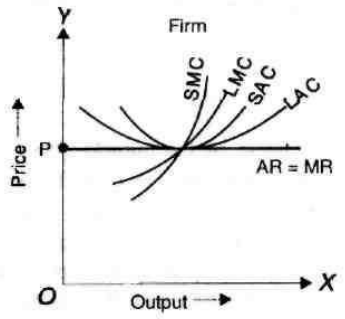


Fig. 8

QS is the supply curve. OQ is the quantity of fish available. DD is the market demand curve. The equilibrium price OP is determined at which quantity demanded is equal to the available supply i.e. at the point where DD intersects the vertical supply curve QS. If demand increases from DD to D_1D_1 supply remaining the same price will increase from OP to OP_1. On the contrary, if there is a decrease in demand from DD to D2D2 the price will fall and the quantity sold will remain the same.

If the commodity is a durable good, its supply can be adjusted to demand. If the demand for commodity declines the firms will start building inventories, while on the

other hand, if demand goes up the firms will increase their supplies out of the existing stocks. The firm can keep on supplying out of its existing stocks only upto the availability of stocks. If demand increases beyond that level, the firm cannot supply any additional quantity of the good. Thus the supply curve for the durable goods is upward sloping upto a distance and then becomes vertical. A firm selling a durable good has a reserve price below which it will not like to sell. The reserve price, is influenced by the cost of production.

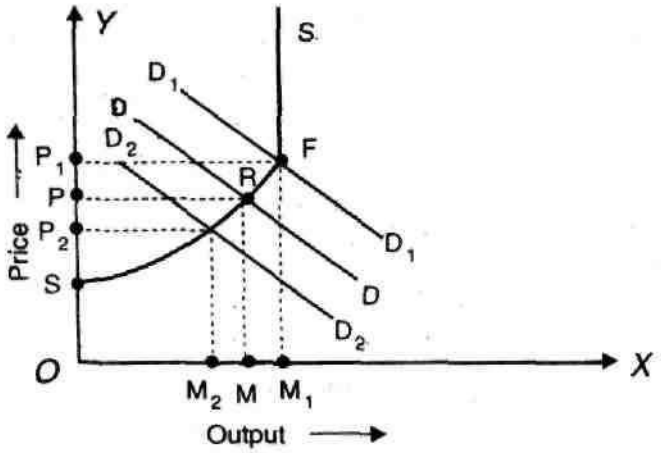


Fig. 9.

SRFS is the supply curve of the durable goods. OM_1 is the total amount of stock available. Upto OP_1 the quantity supplied varies will I price. At OS price, nothing is sold. It is the reserve price. At OP_1 price, the whole stock is offered for sale. DD is the demand curve. Price ul determined at OP at which quantity demanded is equal to the quantity supplied. At this price OM quantity is sold. If demand increases form DD to D_1 D_1 the price will increase to OP_1 and the whole stock will be sold. If the demand decreases from DD to D2D2 the price will fall to OP2 and the amount sold will fall to OM2.

Short run equilibrium

In the short period the firm can vary its supply by changing the variable factors. Moreover, the number of firms in the industry cannot increase or decrease in the short run.

Thus the supply of the industry can be changed only within the limits set by the plant capacity of the existing firms. The short period price is determined by the interaction of short period supply and demand curves. The determination of the short run price is shown in figure 10.

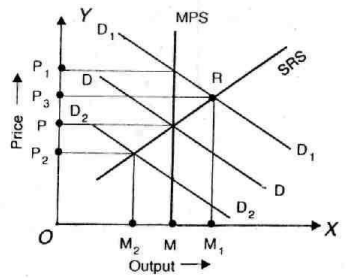


Fig. 10.

DD is the demand curve facing the industry. MPS is the market period supply, curve and SRS is the short run supply curve of the industry. If there is an increase in demand form DD to D1D1 the market price will increase from OP to OP1. The supply of the commodity will be increased by intensive utilisation of fixed factors and increasing the amount of variable factors. So in the short run price will fall to OP3 at which new demand curve D1D1 intersects the short run supply curve SRS. Thus OP3 is the short run price and quantity supplied has increased from OM to OM1.

Long-run equilibrium

In the long run, supply is adjusted to meet the new demand conditions. If there is an increase in demand, the firms in the long run will expand output by increasing the fixed factors of production. They may enlarge their old plants or build new plants. Moreover, in the long run new firms can also enter the industry and thus add to the supplies of the product. The determination of price in the long run is shown in figure 11.

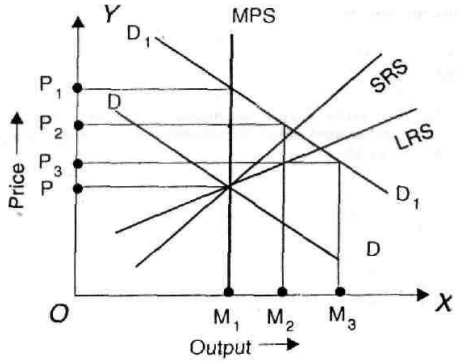


Fig. 11

LRS is the long run supply curve; MPS is the market period supply curve and SRS is the short run supply curve. DD is the market demand curve and OP is the market price. If there is an increase in demand from DD to D1D1 the market price will increase from OP to OP1. In the short run, however, the firms will increase output. Price in the short run will fall to OP2 at which D1D1 intersects the short run supply curve SRS. In the long run new firms will enter the industry. As a result output will increase and price will fall to OP3. Thus OP3 is the long run price.

MONOPOLY AND MONOPOLISTIC COMPETITION

The behaviour of a firm under two different market structures, namely monopoly and monopolistic competition is analysed in detail. While analysing the market structure it is essential to assume that the firms are guided by profit maximization. Monopoly is that market form in which a single producer controls the entire supply of a single commodity which has no close substitutes. There must be only one seller or producer. The commodity produced by the producer must have no close substitutes. Monopoly can exist only when there are strong barriers to entry. The barriers which prevent the entry may be economic, institutional or artificial in nature.

Features

1. There is a single producer or seller of the product.
2. There are no close substitutes for the product. If there is a substitute, then the monopoly power is lost.
3. No freedom to enter as there exists strong barriers to entry.
4. The monopolist may use his monopolistic power in any manner to get maximum revenue. He may also adopt price discrimination.

Price-Output Determination Under Monopoly

The aim of the monopolist is to maximise profits. Therefore, he will produce that level of output and charge a price which gives him the maximum profits. He will be in equilibrium at that price and output at which his profits are maximum. In order words, he will be in equilibrium position at that level of output at which marginal revenue equals marginal cost. The monopolist, to be in equilibrium should satisfy two conditions :

1. Marginal cost should be equal to marginal revenue and
2. The marginal cost curve should cut marginal revenue curve from below.

The short run equilibrium of the monopolist is shown in figure 12.

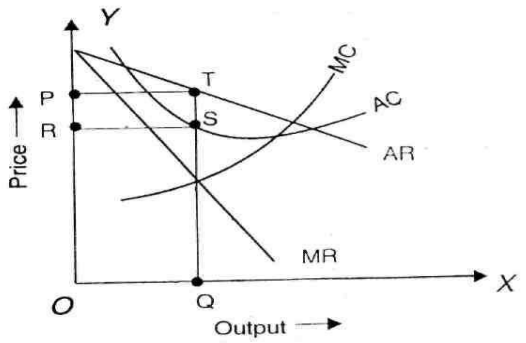


Fig. 12

AR is the average revenue curve, MR is the marginal revenue curve, AC is the average cost curve and MC is the marginal cost curve. Upto OQ level of output marginal revenue is greater than marginal cost but beyond OQ the marginal revenue is less than marginal cost. Therefore, the monopolist will be in equilibrium where MC = MR. Thus a monopolist is in equilibrium at OQ level of output and at OP price. He earns abnormal profit equal to PRST.

But it is not always possible for a monopolist to earn super- normal profits. If the demand and cost situations are not favourable, the monopolist may realise short run losses.

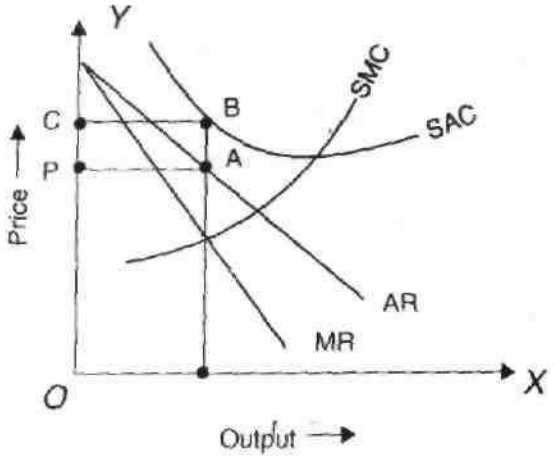


Fig. 13

Though the monopolist is a price maker, due to weak demand and high costs, he suffers a loss equal to PABC.

Long run equilibrium

In the long run the firm has the time to adjust his plant size or to use the existing plant so as to maximise profits. The long run equilibrium of the monopolist is shown in figure 14.

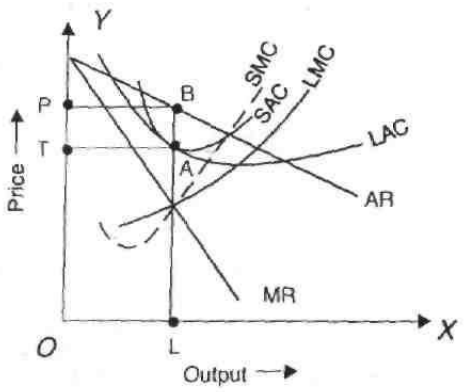
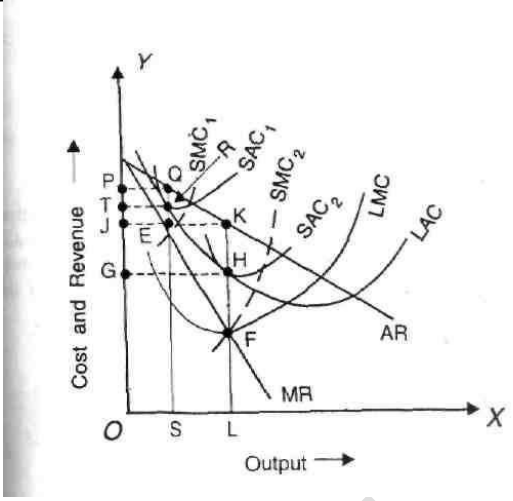


Fig. 14

The monopolist is in equilibrium at OL output where LMC cuts MR curve. He will charge OP price and earn an abnormal profit equal to TPQH. In order to show the difference between the short run equilibrium and long run equilibrium under monopoly, both can be shown in a single figure



The monopolist is in the short run equilibrium at E producing OS level of output. In the long run he can change the plant and will be in equilibrium at F where MR curve cuts LMC curve. The monopolist has increased his output from OS to OL and price has fallen from OP to OJ. Profits have also increased in the long run from TPQR to GHKJ.

PRICE DISCRIMINATION OR DISCRIMINATING MONOPOLY

Price discrimination refers to the practice of selling the same product at different prices to different buyers. Mrs. Robinson defines it as "charging different price for the same product or same price for differentiated product". Prof. Stigler defines price discrimination as "the scale of technically similar products at prices which are not proportional to Marginal costs". Price discrimination may be divided into three types- personal, local and according to use.

Price discrimination is personal when a seller charges different prices for different persons. For example, hair cut for children and adult. Price discrimination is local when the seller charges different prices for people of different localities. For instance, a seller may charge one price at domestic market and another price in international market. Discrimination is according to use when the same commodity is put to different uses. For

example, electricity is usually sold at a cheaper rate for industrial uses than for domestic purposes.

Degrees of price discrimination

Prof. A.C. Pigou has distinguished between three degrees of price discrimination.

1. Price discrimination of the first degree.
2. Price discrimination -of the second degree.
3. Price discrimination of the third degree.

Price discrimination of the first degree

It is also known as perfect price discrimination. Price discrimination of the first degree is said to occur when the monopolist is able to sell each separate unit of the output at a different price. In other words, it involves maximum possible exploitation of each buyer. Price discrimination of the first degree is depicted in figure. 16.

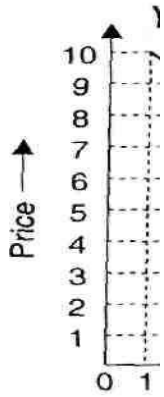


Fig. 16

At price Rs. 10 the buyer will purchase one unit of the good; at price Rs. 9 the buyer would purchase 2 units of the good; at price of Rs. 8 he would purchase 3 units of the good; at price of Rs. 7 he would take 4 units of the good and so on. Under simple monopoly, if the seller fixes the price at Rs. 7 the buyer buys 4 units then he would pay Rs. 28 as the price for 4 units. By doing so, he gets a consumer surplus of Rs. 6. This is so

because; the buyer is willing to pay Rs. 10 for the first unit, Rs. 9 for the second, Rs.8 for the third and Rs. 7 for the fourth. In all he is willing to pay Rs. 34. He actually pays only Rs. 28. But under price discrimination of the first degree the monopolist charges Rs. 34. As a result the buyer has no consumer's surplus.

Price discrimination of the second degree

In price discrimination of the second degree buyers are divided into different groups and from each group a different price is charged which is the lowest demand price of that group. This is shown in figure. 17.

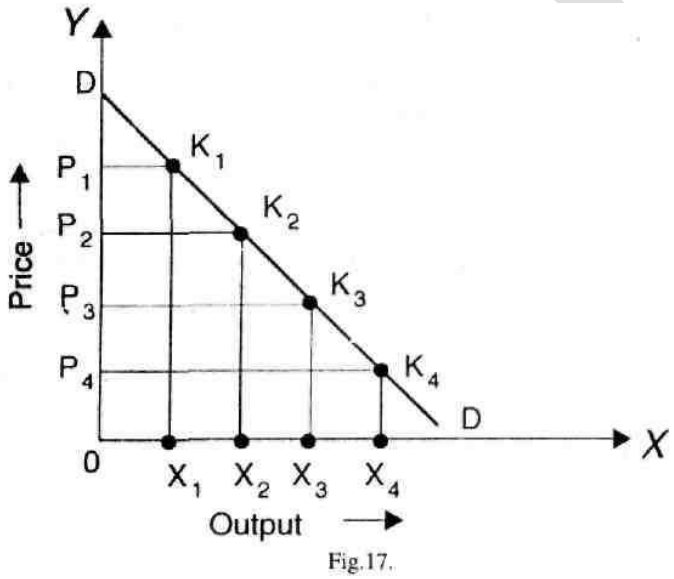


Fig.17.

Market is divided into four groups. DD is the market demand curve. In the first group X units of output will be sold at a price of OP1. All the buyers in this group pay OP1 price and the group gets DK_1 P_1 as consumer's surplus. Similarly for other groups, consumers pay OP2, OP3, OP4 and get the consumer's surplus equal to DK2 P2, DK3 P3 and DK4 P4 respectively.

Price discrimination of the third degree

It occurs when the seller divides his buyers into two or more than two sub-markets or groups and charges a different price in each sub- market. The price charged in the

sub- market need not be the lowest demand price of that sub- market.

Possibility of price discrimination

Price discrimination is possible in the following cases:

1. The nature of the commodity should be such as to enable the monopolist to charge different prices. This is possible only when there is no possibility of transference of the commodity from one market to the other. For example, doctors charge different fees for the rich and for the poor for same service.

   When the markets are separated by long distance or tariff, then price discrimination is possible. If the transportation cost is higher than the price difference between the two markets, one monopolist can charge different prices. For example, a commodity may be sold at Rs. 10 in Delhi and Rs. 20 in Madras. If the transportation cost between Delhi and Madras is greater than Rs. 10 it is not profitable for the consumers to transport the commodity from Delhi to Madras on their own. Similarly when domestic market is protected by tariff, the monopolist can sell the product at a lower price in the foreign market and at a higher price in the domestic market.

2.In certain cases, the firms have a legal sanction for price discrimination. For example, electricity board charges a lower price for industrial purposes and a higher price for domestic purposes. Similarly, transportation companies charge different fares for different classes of passengers.

3. Price discrimination is possible due to preferences or prejudices of the consumers. Different prices are charged for different varieties although they differ only in label or name. Upper class people may prefer to buy in fashionable quarters to buy in a congested, ugly and cheaper locality.

4. Price discrimination may become possible due to ignorance and laziness of buyers. If a seller is discriminating between two markets but the buyers are ignorant that the seller is selling the product at a lower price in another market, price discrimination is possible. Price

discrimination is also possible if the buyers are aware that the seller is selling the product at lower price in another market but due to laziness may not go for shopping, in the cheaper market.

5. When a monopolist is able to meet different needs for his customers it is possible for him to follow price discrimination. For example, railways charge different rates for carrying coal, cotton, silk and fruit even though the service rendered is the same for all.

6. A monopolist can easily charge discriminating prices when goods are being supplied to special orders. In such a case, there is no question of comparing prices by the buyers. It is obvious that price discrimination can be practised only under imperfect competition. It is not at all possible when there is perfect competition. Under perfect competition, the seller has to take the market price as given.

Therefore, there is no scope for price discrimination. The possibility of price discrimination under perfect competition exists only if all sellers are combined together. But as soon as they combine, perfect competition ceases to exist. Price discrimination can occur under conditions of imperfect or monopolistic competition. Larger the market imperfection, greater is the possibility of price discrimination. When there is monopoly, the market imperfection is maximum and the possibility of price discrimination is also maximum. Since, in case of a monopoly there are no other sellers selling the same product or its substitutes, the monopolist is in a position to charge different prices from different parts of the market.

Conditions for profitable price discrimination

The monopolist may be able to charge discriminating prices but it need not necessarily be profitable for him. It is only when the elasticity of demand in one market is different from the elasticity of demand in the other market that the monopolist will find the policy of price discrimination profitable. The monopolist will find it profitable to charge more in the market where elasticity is low and low price where it is high. Mrs. Robinson says, "The submarkets will be arranged in ascending order of their elasticities, the highest

price being charged in the least elastic market, and the lowest price in the most elastic market".

Same elasticity of demand in two markets

If the elasticity of demand is same in two markets, the marginal revenues in two markets at every price of the product will also be the same and it will not be profitable for the monopolist to discriminate between the two markets. This is illustrated in figure 18.

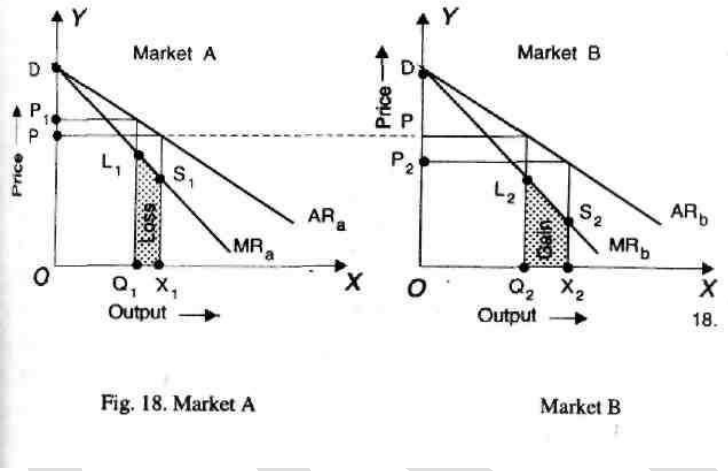


Fig. 18. Market A Market B

ARa and ARb are the iso-elastic demand curves of the markets A and B. At price OP marginal revenue in the two markets is the same. If the monopolist transfers a given amount from one market te another and thereby charge different prices, it would not be profitable for the monopolist. Suppose, he reduces his sales in market A from OX to OQ_1 and transfer it to market B, where the sales go up from OQ2 to OX2. As a result of reduced sales in market A, the monopolist loses Q1 X1 S1 L1 while he gains Q2 X2 L2 S2 in market B by increasing his sales. Since the loss is greater than the gain, it is not profitable for the monopolist to discriminate prices between the two markets having the same elasticity of demand.

Elasticity of demand differs in two markets

If the monopolist wants to maximum profits, he must discriminate prices if the

elasticities of demand in the two markets at the given monopoly prices are different. This is shown in Figure 19.

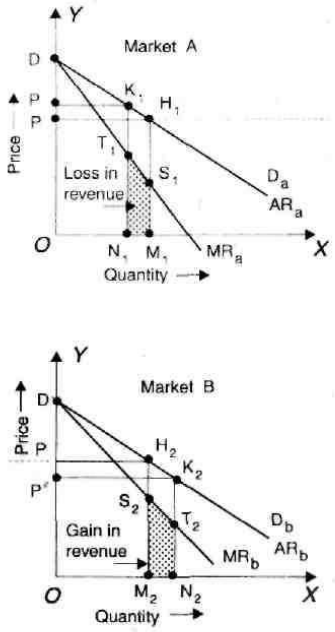


Fig. 19.

The monopolist reduces the output in market B and transfers it to market A. When he increases his sales in market A from OX to OQi, he gains Xi Qj L\ S \ and when he reduces it in market B his sales go down from OQ2 to OX2, he loses X2 Q2 L2 S2. Since the gain is more than the loss it is profitable for the monopolist to follow price discrimination.

Price-output determination under discriminating monopoly

The graphical representation of price-output determination under conditions of discriminating monopoly can be shown with the help of a figure. There are two markets A and B with different price elasticity's. The price elasticity in market B is lower than that in market A.

The total marginal revenue arising from the two markets is arrived at by horizontal summation of the marginal revenue curves for the two sub- markets. Da is the demand curve and MRa is the marginal revenue curve in market A. Similarly, MRb is the marginal revenue curve in market B corresponding to the demand curve D. AMR is the

aggregate marginal revenue curve, which has been derived by adding MRa and MR5 . MC is the marginal cost curve of the monopolist.

The discriminating monopolist will maximise his profits by producing that level of output at which MC intersects AMR. Thus he will be producing OM level of output. This total output will be distributed in such a way that marginal revenues in two markets are equal and at the same time it should be equal to the marginal cost. Since marginal cost is ME, the total output OM has to be distributed in such a way that the marginal revenue in two markets should be equal to the marginal cost. Hence OM amount can be sold in market A and OM2 in market B. Further, OM amount can be sold in market A at M_1 P_1 price and OM2 can be sold in market B at M2 P2 Price. Price is higher in market A where the demand is less elastic than in market B where the demand is more elastic. Thus a profit maximising monopolist charges different prices and supplies different quantities in the sub-markets having different price elasticities.

Equilibrium under price discrimination in the case of dumping

A special case of price discrimination is one in which a producer sells in two markets, one under conditions of perfect competition and another under the conditions of monopoly. Such a situation occurs when a producer sells his product in domestic market in which he is a monopolist and also in the world market which is perfectly competitive.

In the domestic market in which the producer has a monopoly average revenue curve ARH slopes downwards. In the world market in which there is perfect competition, the demand curve is perfectly elastic the average revenue curve ARW is horizontal and MR curve coincides with it. MC is the marginal cost curve. Aggregate marginal revenue curve is BFED which is the summation of MRH and MRW. MC intersects the aggregate marginal revenue curve at E and the equilibrium level of output is OM. This total output OM has to be distributed between domestic market and world market in such a way that marginal revenue in each market is equal to each other and to the marginal cost. Therefore, OR will be

sold in the domestic market at the price of OP^ and RM will be sold in the world market at price OPw. Total profit earned by the producer is CEFB. Price in the world market is lower than the price in the home market. When a producer charges a lower price in, the world market than in the home market, he is said to be dumping in the world market.

Monopoly equilibrium Vs Competitive equilibrium

The only similarity between the two is that a firm is in equilibrium at the level of output at which marginal revenue is equal to marginal cost. But there are many differences:

1.Under perfect competition, the average revenue curve is horizontal straight line parallel to the X axis. Therefore, MR is equal to AR at all levels of output and MR curve coincides with AR curve. But under monopoly, AR is sloping downwards. Hence, MR is less than AR at all levels of output and MR curve lies below the AR curve. In equilibrium the marginal revenue will be smaller than the average revenue.

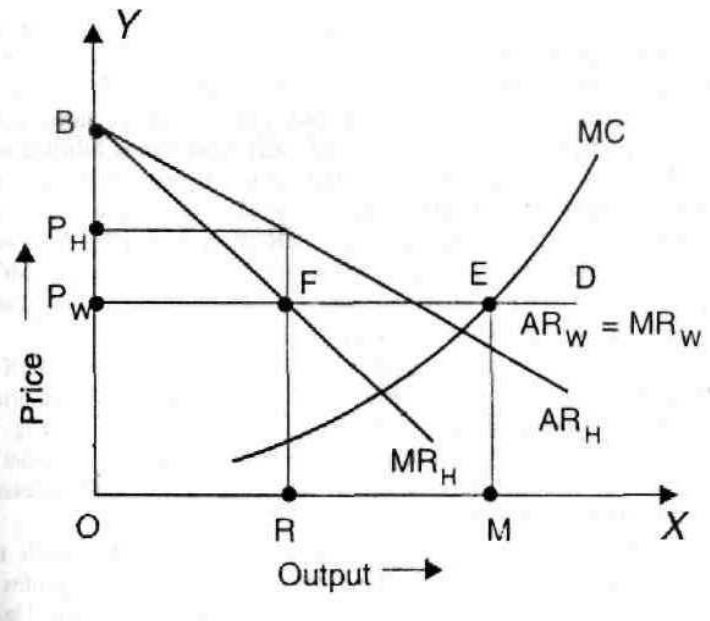


Fig. 22

2.Both under perfect competition and monopoly, the firm is in equilibrium where MC is equal to MR. But in perfect competition, when MC is equal to MR, it is also equal to price or AR. This is not so in case of monopoly. Under monopoly, MR is less than AR or price; in equilibrium MC will be equal to MR but it will be less than price. Therefore, in perfect competition, price is equal to MC and in monopoly price is higher than the marginal cost.

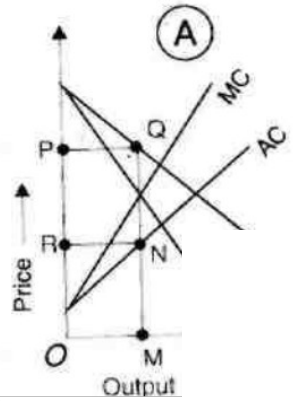
3.Another significant difference between the two is that whereas a perfectly competitive firm is in long-run equilibrium at the minimum point of the long-run average cost curve, monopolistic firm is in equilibrium at the level of output where average cost is still declining and has not yet reached its minimum point. Under perfect competition, it pays the firm to expand production so long as the average cost is falling since AR and MR remain constant. But it does not pay a monopolist firm to expand production to the minimum of AC curve.

4.Another important difference between the two is that while under perfect competition equilibrium is possible only when MC is rising at the point of equilibrium, but monopoly equilibrium can be reached whether marginal cost is rising, remaining constant or falling at the equilibrium output. This is so because the second order condition of equilibrium namely MC curve should cut MR curve from below at the equilibrium point, can be satisfied in monopoly in all the three cases, whereas in perfect competition the second order condition is fulfilled only when MC curve is rising. Since in perfect competition the MR curve is a horizontal straight line, MC curve can cut the MR curve from below only when MC is rising. But under monopoly MR curve is sloping downward and therefore, MC curve can cut the MR curve from below whether MC is rising, remaining constant or falling. The equilibrium of the monopolist in these three cases is shown in Figure 22. Fig. A illustrates the equilibrium of the monopolist when MC is rising at the equilibrium output. Fig. B shows the monopoly equilibrium when MC is constant at and near the equilibrium output. In Fig. C, monopolist is in equilibrium when MC is falling at and near the point of equilibrium. In all these three cases, OP represents

price, OM represents output and RNQP represents profit.

5. Still another difference between the two is that while the perfectly competitive firm in the long run, earns only normal profits, a monopolist can make supernormal profits even in the long run. Under perfect competition, if firms in the short run are making supernormal profits, the new firms will enter the industry to compete away the profits. But under monopoly, the firm continues to earn supernormal profits even in the long run since there are strong barriers to the entry of new firms in monopoly.

It does not mean that the monopoly always guarantees supernormal profits. If the demand and cost conditions are not favourable, the monopolist may suffer short run losses, as shown in the followings



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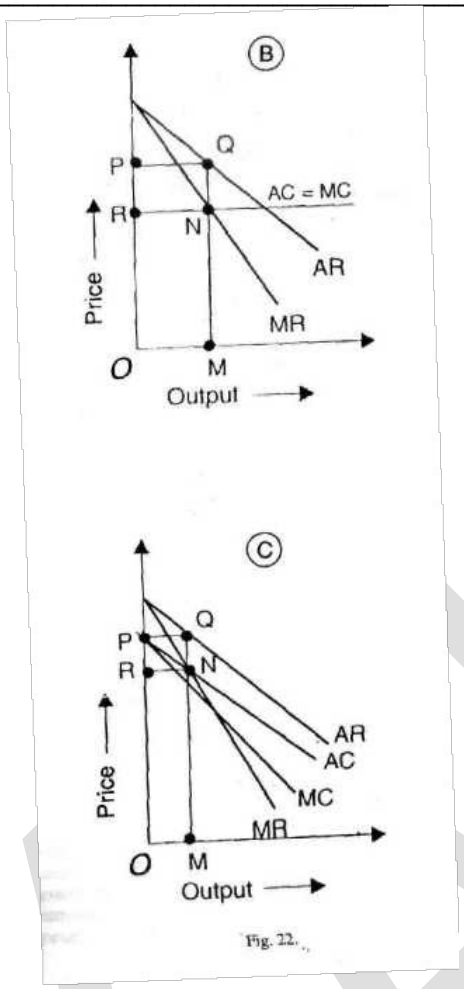

Fig. 22.

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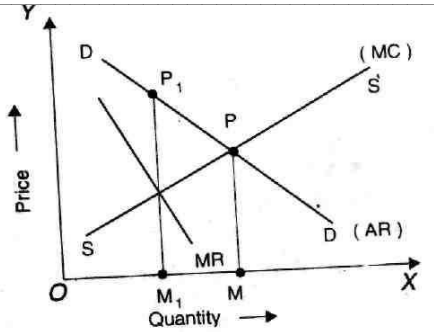
6. Another important difference between monopoly equilibrium and perfectly competitive equilibrium is that under monopoly, price is higher and output smaller than under perfect competition. Price-output level under perfect competition and monopoly is shown in figure. 24.



DD and SS are demand and supply curves of the perfectly competitive industry. The two curves intersect each other at P. Therefore, under perfect competition, price is MP and output is OM. Under monopoly, SS will be the marginal cost curve, MR curve cuts MC curve determining the monopoly price at M_1 P_1 and monopoly output at OM_1. Thus monopoly has resulted in a higher price and a lower output. Thus monopoly restricts output to raise price.

7. Another significant difference between monopoly and perfect competition is that a monopolist can charge discriminatory prices for his goods but a firm operating under perfect competition cannot. Under perfect competition, the price is fixed by the market and the producer cannot exercise any control over it. The question of charging different prices from different set of customers does not arise. On the other hand, a monopolist finds price discrimination both possible and profitable. For this purpose, he splits the market for his goods into sub markets on the basis of elasticity of demand. Under perfect competition the demand curve is perfectly elastic. But under monopoly the demand curve is relatively inelastic. Therefore he can charge different prices in different parts of the market.

MONOPOLISTIC COMPETITION

Perfect competition and monopoly are rarely found in the real world. Therefore, professor Edward. H. Chamberlin of Harvard University brought about a synthesis of the two theories and put forth, "Theory of Monopolistic Competition" in 1933. Monopolistic

competition is more realistic than either pure competition or monopoly. It is a blending of competition and monopoly.

"There is competition which is keen though not perfect, between many firms making very similar products". Thus monopolistic competition refers to competition among a large number of sellers producing close but not perfect substitutes.

FEATURES

1. **Large number of sellers**

In monopolistic competition the number of sellers is large. No one controls a major portion of the total output. Hence each firm has a very limited control over the price of the product. Each firm decides its own price-output policy without considering the reactions of rival firms. Thus there is no interdependence between firms and each seller pursues an independent course of action.

2. Product differentiation

One of the most important features of monopolistic competition is product differentiation. Product differentiation implies that products are different in some ways from each other. They are heterogeneous rather than homogeneous. There is slight difference between one product and others in the same category. Products are close substitutes but not perfect substitutes. Product differentiation may be due to differences in the quality of the product. Product may be differentiated in order to suit the tastes and preferences of the consumers.

The products are differentiated on the basis of materials used, workmanship, durability, size, shape, design, colour, fragrance, packing etc. Products are differentiated in order to promote sales by influencing the demand for the products. This can be achieved through propaganda and advertisement. Advertisement brings a psychological reaction in the minds of the buyers and thus influences the demand. In addition, location of the shop, its general appearance, counter service, credit and other

facilities increase sales. Patent rights and trademarks also promote product differentiation. Kodak and Coca Cola are the examples of patent rights. Trademarks like Hamam, Rexona, Lux etc. help the consumers to differentiate one product over others.

3. Free entry and exit of firms

Another feature of monopolistic competition is the freedom of entry and exit of firms. Firms under monopolistic competition are small in size and they are capable of producing close substitutes. Hence they are free to enter or leave the industry in the long run. Product differentiation increases entry of new firms in the group because each firm produces a different product from the others.

4. Selling cost

It is an important feature of monopolistic competition. As there is keen competition among the firms, they advertise their products in order to attract the customers and sell more. Thus selling cost has a bearing on price determination under monopolistic competition.

5. Group equilibrium

Chamberlin introduced the concept of group in the place of industry. Industry refers to a number of firms producing homogeneous products. But, firms under monopolistic competition produce similar but not identical products. Therefore, Chamberlin uses, the concept of group to include firms producing goods which are close substitutes.

6. Nature of demand curve

Under monopolistic competition, a single firm can control only a small portion of the total output. Though there is product differentiation, as products are close substitutes, a reduction in price leads to increase in sales and vice- versa. But it will have little effect on the price-output conditions of other firms. Hence each will lose only few customers, due to an increase in price.

Similarly a reduction in price will increase sales. Therefore the demand curve of a firm under monopolistic competition slopes downwards to the right. It is highly elastic but not perfectly elastic. In other words, under monopolistic competition, the demand curve faced by the firm is highly elastic. It means that it has some control over price due to product differentiation and there are price differentials between the firms.

Price-Output Determination under Monopolistic Competition

Since, under monopolistic competition, different firms produce different varieties of products, prices will be determined on the basis of demand and cost conditions. The firms aim at profit maximisation by making adjustments in price and output, product adjustment and adjustment of selling costs. Equilibrium of a firm under monopolistic competition is based upon the following assumptions:

- The number of sellers is large and they act independently of each other.
- The product is differentiated.
- The firm has a demand curve which is elastic.
- The supply of factor services is perfectly elastic.
- The short run cost curves of each firm differ from each other.
- No new firms enter the industry.

Individual Equilibrium and Price Variation

Based on these assumptions, each firm fixes such price and output which maximises its profit. Product is held constant. The only variable is price. The equilibrium price and output is determined at a point where the short run marginal cost equals marginal revenue. The equilibrium of a firm under monopolistic competition is

shown in figure 25. DD is the demand curve of the firm. It is also the average revenue curve of the firm. MC is the marginal cost of the firm. The firm will maximise profits by equating marginal cost with marginal revenue.

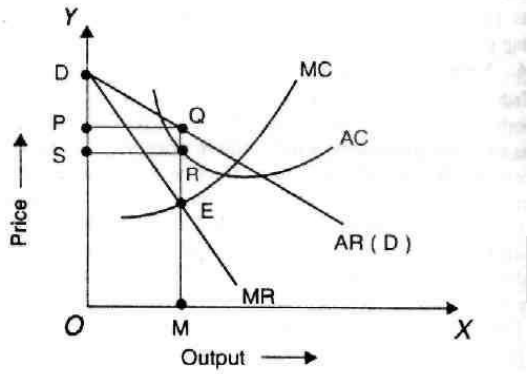


Fig. 25

The firm maximises its profit by producing OM level of output and selling it at a price of OP. The profit earned by the firm is PQRS. Thus in the short run, a firm under monopolistic competition earns supernormal profits. In the short run, the firm may incur losses also. This is sho

The firm is s the price at OP. As price is less than cc equilibrium under monopolistic competi depending upon the position of the deman

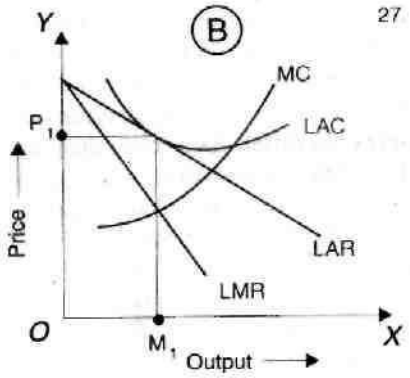
Group Equilibrium a

Group equi number of firms whose products are c al characteristics. The difference in the quality of the products of the firms under monopolistic competition results in large variation in elasticity and position of the demand curves of the various firms. Similarly the shape and position of cost curves too differ. As a result there exist

differences in prices,

output and profits of the various firms in the group. For the sake of simplicity in the analysis of group equilibrium, Chamberlin ignores these differences by adopting infirmity assumption. He assumes that the cost and demand curves of all the products in the group are uniform. Chamberlin introduces another assumption known as 'symmetry assumption'.

It means that the number of firms under monopolistic competition is large and hence the action of an individual firm regarding price and output will have a negligible effect upon his rivals. Figure (A) represents short run equilibrium and figures (B) the long run equilibrium. In the short run, the price is OP and average cost is only MR. Hence there is supernormal profit equal to PQRS. But in the long run, as shown in figure 27 (B), the excess profit is competed away. MC = MR at OM level of output. LAR is tangent to LAC. Price is equal to average cost and there is no extra profit. Only normal profit is earned.



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Product Differentiation

While analysing the equilibrium of a firm with regard to the variation of the product we assume the price of product to be constant. The firm has to select among the various possible qualities and attributes of the product. An important characteristic of product variation is that it changes the cost curve and demand for the product. Therefore,

the entrepreneur has to choose the product whose cost and demand are such as to yield maximum profit. Yet another feature of product variation is that product variation is qualitative and therefore, quantitative measurement is not possible.

Individual Equilibrium And Product Variation

The equilibrium of the firm under condition of product variation is shown in figure 28.

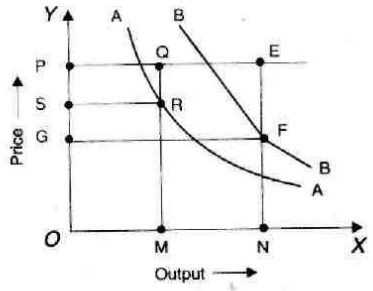


Fig. 28.

AA is the average cost curve of the product A and BB is the average cost curve of the product B. The price of the product is OP. If OM quantity of the product A is demanded at the price of OP, the total costs are OMRS. The entrepreneur earns an abnormal profit equal to PQRS. If the Quantity demanded of the product B is ON, then the total costs are ONFG and the total profits made by the entrepreneur are GFEP. Since the product B yields greater profits than A, the entrepreneur will select the product B.

Group Equilibrium and Product Variation

It is assumed that the demand is uniform and the possibility of product variation is also uniform. The equilibrium adjustment of the product is shown in figure 29.

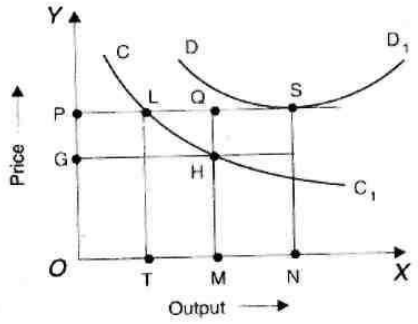


Fig. 29

CC1 is the average cost curve. If the quantity demanded is OM then the total cost - is OMHG. The firm earns supernormal profits equal to GHQP. This supernormal profits should be wiped away to achieve group equilibrium. Attracted by the supernormal profits, new competitor may enter the group. The quantity demanded will come down to OT. Price will cover only cost of production. Besides, the adjustment in the number of firms, product improvement may also take place. When all entrepreneurs improve their product, cost will increase as shown by DD_1 and become equal to the price at the point S.

Group equilibrium must satisfy the following conditions:

1. The average cost must be equal to price.
2. It is not possible for anyone to increase his profits by making further adjustment or improvement in his product.

Selling Cost and Price Determination

Selling cost is another important factor which influences pricing under monopolistic competition. Selling costs are costs incurred on advertising, publicity, salesmanship, free sampling, free service, door to door canvassing and so on. Selling costs are "the costs necessary to persuade a buyer to buy one product rather than another or to buy from one seller rather than another". Under perfect competition, there is no need for advertising as the product is homogeneous. Similarly, under monopoly also, selling costs are not needed as there are no rivals. But under conditions of monopolistic

competition, as the products are differentiated, selling costs are essential to increase sales. Chamberlin defines selling cost, "as costs incurred in order to alter the portion or shape of the demand curve for a product".

Advertisement may be classified into two types: informative and competitive. Informative advertisement enables the buyers to know about existence and uses of the product. It also helps to increase sales of all firms in the group. Competitive advertisement refers to expenses incurred to increase the sales of the product of a particular firm as against other products.

Production cost versus selling cost

Though Watson feels that it is difficult to differentiate selling cost from cost of production, Chamberlin states that these two costs are basically different from one another. Production costs include all expenses incurred in producing a product and transporting it to its destination for consumers. Selling costs are incurred to change the preferences of a consumer for a particular product. Prof. Chamberlin distinguishes between the two in these words: "The former (production) costs create utilities in order that demands may be satisfied; the latter create and shift the demand curves themselves."

Those which alter the demand curve for a product are selling costs and those which do not are production costs. In other words, "those made to adapt the product to the demand

arc production costs and those made to adapt the demand to the product are selling costs". The production cost affects the supply but selling cost affects the demand. While the production cost influences the volume of production, the selling cost influences the volume of sales.

Selling costs are subject to varying returns. When selling cost , increases, first it leads to increasing returns and then to diminishing returns. Two factors are responsible for increasing returns.

1. Repeated and continuous advertisements bring in increasing returns. Advertisement seen

once will have negligible or no effect on consumer. Therefore, selling cost is a waste. Continued advertising over a period of time and in different media brings favourable effect.

2. Economies of large scale selling operations also lead to increasing returns. But as advertising outlay increases, diminishing returns set in due to change in taste and preferences of the people. Further, existing buyers may not increase their demand as a result of advertisement. This is because as he buys more, utility falls. The curve of selling cost is U-shaped, due to-the operation of the law of variable proportions.

Individual Equilibrium and Selling Cost

Here it is assumed that the seller adjusts his selling cost keeping the price and product constant. It is also assumed that one seller alone advertises, while all others do not. As a result he attracts new buyers, sells more and makes profit. This is illustrated in figure 32.

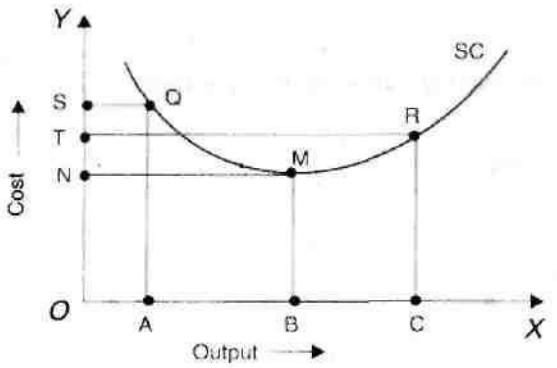


Fig. 31.

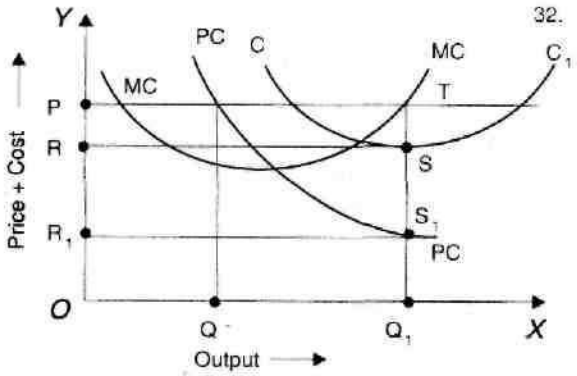


Fig. 32

PC is the production cost curve. CC_1 is the combined production and selling cost curve. MC is the marginal cost curve. If the seller sells OQ level of output at OP price, he has no profit. His cost of production is equal to price. Therefore, he advertises his product which increases his cost. His combined production and selling costs are indicated by CC_1. At OQ_1 level of output, his production cost is equal to OQ_1 S_1 R_1. His selling cost is R_1 S_1 SR. He earns an abnormal profit equal to PRST.

Group Equilibrium and Selling Cost

The abnormal profit earned by the firm makes all other firms in the group advertise. When all firms advertise total cost of all will increase. Price will be equal to cost. There is no abnormal profit. All firms earn only normal profit. This is shown in figure 33.

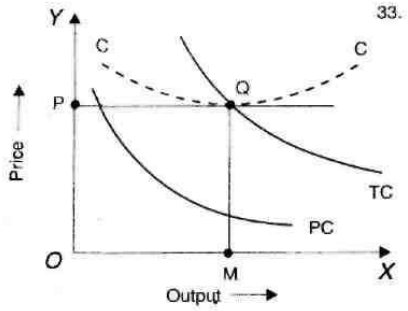


Fig. 33

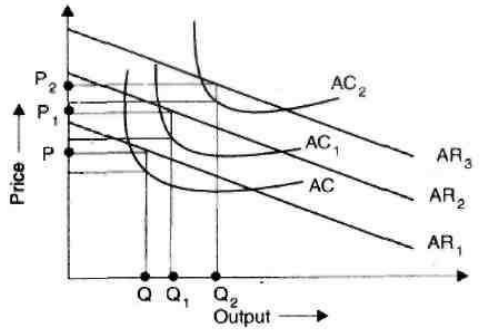
PC is the production cost curve. TC is the total cost curve of the single firm. Due to competition from others, the cost is equal to price. CC is the total cost curve of all the firms in the group. As it is tangent to the price, there is no abnormal profit.

Optimum Selling Costs

A producer undertakes advertisement only when it brings additional revenue. The producer will increase his advertising expenditure as long as the marginal revenue is greater than marginal cost. He will stop at the point at which marginal revenue is greater than marginal cost. He will stop at the point at which marginal revenue is equal to marginal cost. Only at that point, profit will be maximum. This is shown in figure 34.

AR_1 is the average revenue curve before advertisement. AC is the average cost curve. OP is the price. The equilibrium level of output is OQ. If advertisement is undertaken, average revenue curve will shift from AR_1 to AR2 The average cost curve AC_1 includes the cost of advertisement. The equilibrium price will be OP_1 and the output OQ_1 Profits will be larger. Since profits have increased the firm will continue its

advertisement expenditure till the marginal revenue is equal to marginal cost. Profit maximisation is achieved at OP2 price and OQ2 output. Beyond this point, advertisement expenditure will lead to fall in profit.



Therefore, a producer under monopolistic competition has to select that cost and revenue curves where the profits are maximum.

DUOPOLY AND OLIGOPOLY

The other forms of market situations, Duopoly and Oligopoly are dealt in this lesson. When there are few sellers of homogeneous or differentiated product, it is the oligopoly market structure. If there are only two sellers, it is a Duopoly market structure.

Duopoly

When there are two monopolists who share the monopoly power then it is called duopoly. It may be of two types-duopoly without product differentiation and duopoly with product differentiation. Under duopoly without product differentiation, there are two monopolists selling an identical commodity. There is no product differentiation. There is also a possibility for collusion. They may agree on price or divide the market for goods. Suppose, if there is no agreement between the two, a constant price war will emerge. In this case they will earn only normal profits. If their costs are different, the one with lower costs will squeeze out the other and a simple monopoly would result.

The best course for the duopolists will be to fix the monopoly price and share the market and profits. In the. short run, duopoly price may be lower than the

competitive price. In the long run, the price may.be somewhere between the monopoly price and the competitive price. When there is product differentiation, each producer will have his own customers. There is no danger of price war. There is no agreement. Since products are differentiated the firm with better product will earn supernormal profits.

OLIGOPOLY

Oligopoly is a situation in which few large firms compete against each other and there is an element of interdependence in the decision making of these firms. A policy change on the part of one firm will have immediate effects on competitors, who react with their counter policies.

Features

Following are the features of oligopoly which distinguish it from .other market structures :

1. Small number of large sellers.

The number of sellers dealing in a homogeneous or differentiated product is small. The policy of one seller will have a noticeable impact on market, mainly on price and output.

2. Interdependence.

Unlike perfect competition and monopoly, the oligopolist is not independent to take decisions. The oligopolist has to take into account the actions and reactions of his rivals while deciding his price and output policies. As the products of the oligopolist are close substitutes, the cross elasticity of demand is very high.

3.Price rigidity.

Any change in price by one oligopolist invites retaliation and counter- action from others, the oligopolist normally sticks to one price. If an oligopolist reduces his price, his rivals will also do so and therefore, it is not advantageous for the oligopolist to reduce the price. On the other hand, if an oligopolist tries to raise the price, others will not do so. As a result they capture the customers of this firm. Hence the oligopolist would never try to either reduce or raise the price. This results in price rigidity.

4.Monopoly element.

As products are differentiated the firms enjoy some monopoly power. Further, when firms collude with each other, they can work together to raise the price and earn some monopoly income.

5.Advertising.

The only way open to the oligopolists to raise his sales is either by advertising or improving the quality of the product. Advertisement expenditure is used as an effective tool to shift the demand in favour of the product. Quality improvement will also shift the demand favorably. Usually, both advertisements as well as variations in designs and quality are used simultaneously to maintain and increase the market share of an oligopolistic.

6. Group behaviour.

The firms under oligopoly recognise their interdependence and realise the importance of mutual cooperation. Therefore, there is a tendency among them for collusion. Collusion as well as competition prevail in the oligopolistic market leading to uncertainty and indeterminateness.

7. Indeterminate demand curve.

It is not possible for an oligopolist to forecast the nature and position of the demand curve with certainty. The firm cannot estimate the sales when it decides to reduce the price. Hence the demand curve under oligopoly is indeterminate.

Types of oligopoly.

Oligopoly may be classified in the following ways:

a. Perfect and imperfect oligopoly.

On the basis of the nature of product, oligopoly may be classified into perfect (pure) and imperfect (differentiated) oligopoly. If the products are homogeneous, then oligopoly is called as perfect or pure oligopoly. If the products are differentiated and are close substitutes, then it is called as imperfect or differentiated oligopoly.

b. Open or closed oligopoly.

On the basis of possibility of entry of new firms, oligopoly may be classified into open or closed oligopoly. When new firms are free to enter, it is open oligopoly. When few firms dominate the market and new firms do not have a free entry into the industry, it is called closed oligopoly.

c. Partial and full oligopoly.

Partial oligopoly refers to a situation where one firm acts as the leader and others follow it. On the other hand, full oligopoly exists where no firm is dominating as the price leader.

d. Collusive and non- collusive oligopoly.

Instead of competition with each other, if the firms follow a common price policy, it is called collusive oligopoly. If the collusion is in the form of an agreement, it is called open collusion. If it is an understanding between the firms, then it is a secret collusion. On the other hand, if there is no agreement or understanding between oligopoly firms, it is known as non-collusive oligopoly.

e. Syndicated and organised oligopoly.

Syndicated oligopoly is one in which the firms sell their products through a centralised syndicate. Organised oligopoly refers to the situation where the firms organise themselves into a central association for fixing prices, output, quota etc.

Models of Oligopoly

1. Cournot's model of oligopoly : Augustin Cournot, a French economist, published his theory of duopoly in 1838. Cournot dealt with a case of duopoly. He has taken the case of two identical mineral springs

operated by two owners. His model is based on the following assumptions :

1. The product is homogenous.

2. There is no cost of production. The average cost and marginal cost are zero.
3. Output of the rival is assumed to be constant.
1. The market demand for the product is linear.

Cournot's model

DB is the market demand curve. OB is the total quantity of mineral water which can be produced and supplied by the two producers. If both the producers produce the maximum quantity of OB, the price will be zero. This is because cost of production is assumed to be zero. Cournot assumes that one producer say X starts production first. He will produce OA output and his profit will be OAPK. Suppose the second producer Y enters into the market. He assumes that the first producer will continue to produce the same. So Y considers PB as his demand curve.

With this demand curve, he will produce AH amount of output. The total output will now be OA + AH = OH and the price will fall to OF. The total profits for both the producers will be OHQR. Out of this total profits, producers X will get OAGF and Y will receive AHQG. Now that the profits of producers X are reduced from OAPK to OAGF by producers Y producing AH output, producer X will reconsider the situation. But he will assume that producer Y will continue to produce AH output. Therefore, he reduces his output from OA to OT. Now the total output will be OT + AH = ON and the price will be OS and the total profits

of the two will be ONRS. Out of the total profits, X will get OTLS and Y will get TNRL. Now the producer Y will reappraise his situation. Believing that producer X will continue producing OT, the producer Y will find his maximum profits by producing output equal to 1/2 TB. With this move of producer Y, producer X will find his profits reduced.

Therefore, X will reconsider his position. This process of adjustment and readjustment by each producer will continue, until the total output OM is produced and each is producing the same amount of output. In the final position, producer X produces OC amount of output and producer Y produces CM amount of output and OC = CM. Cournot's duopoly solution can be extended to a situation with more than two sellers. If there were three producers, the total output would be 3/4 of OB, each producing 1/4 OB. If there are n producers, then under Cournot's solutions, the total output produced will be n / (n+1) of OB where OB is the maximum possible output. The essential conclusion is that, as the number of sellers increases from one to infinity the price is continually lowered from what it would be under monopoly conditions to what it would be under purely competitive conditions, and that for any number of sellers, it is perfectly determinate. The basic weakness of Cournot's duopoly model is that the rivals assume the output of the other to be fixed, even though they observe constant changes in output.

Possible Questions – PART – B

1. Define Monopolistic Competition.
2. List out the features of Perfect Competition
3. What is meant by Price Discrimination?
4. What is Perfect Competition?
5. What are the features of 'Monopoly Competition'?
6. Write the meaning of 'Equilibrium Price'.
7. What is a Market according to Economic Theory?
8. What is an 'Oligopoly'?
9. State the meaning of the terms 'Price' and 'Pricing'.
10. How would you classify the 'Markets' on the basis of competition?
11. What is 'Imperfect Competition'?
12. State the meaning of 'Duopoly'.

13. What are the features of Monopoly Firm?
14. What do you meant by 'Price Discrimination'?
15. Define the term 'Business Cycle'.

***CIA – 3 X 2 = 6 Marks**
****ESE – 5 X 2 = 10 Marks**

PART – C

1. What is meant by Monopoly? Describe the process of Price Discrimination under Monopoly in the short-run and the long-run.
2. Explain indifference curve analysis with help of diagram.
3. Explain the main features of Monopolistic Competition. How is the price determined in this market structure (a) in the short - run and (b) in the long – run?
4. How the demographic shift changes in the demand and supply? Explain with diagram.
5. 'The Demand Curve under Oligopoly is indeterminate' - Discuss.
6. Explain how the price determined under 'Perfect Competition'?
7. Explain the term 'Price Discrimination' and 'Kinked Demand Curve' under Oligopoly?
8. Discuss the factors that influence the level of National Income.
9. Explain the features of Oligopoly and discuss about Kinked Demand Curve.
10. Define the term 'Business Cycle'. Discuss the different phases and effects of Business Cycle.

***CIA – 3 X 8 = 24 Marks (EITHER OR TYPE)**
****ESE – 5 X 6 = 30 Marks (EITHER OR TYPE)**

Unit – IV: Factor market : Demand for a factor by a firm under marginal productivity theory (Perfect Competition in the Product market, monopoly in the product market) – Market Demand for a factor – Supply of labour - Market supply of labour – Factor Market Equilibrium

Historically, economics, especially microeconomics, began with the discussion of how incomes are determined: the relative incomes (shares of the national income) of labour, owners of capital, and owners of land (i.e. natural resources). Adam Smith (*The Wealth of Nations,* 1776), David Ricardo (*Principles,* 1817), Karl Marx *(Das Kapital,* 1867*),* and others (Malthus, J.S. Mill) all were concerned with this question which was related for them to the **theory of value**. Smith, Ricardo, and Marx developed a **labour theory of value:** the value of a good or service is determined (or defined) in terms of the amount of labour embodied in its production.

This has now been replaced in mainstream economic thought by marginal utility theory and demand-supply analysis: the value of a good or service is the price at which the marginal unit is exchanged. More crudely, a good or service is worth exactly what someone is willing to pay for it. Just as for final goods and services, the price of a particular factor of production is set, assuming a competitive market for the factor, by the interaction of demand and supply.

The prices of factors have various names:

labour - wages, salaries, compensation

capital - profit, interest and dividends, the return on capital

land - rent (not to be confused with economic rent, see below).

Capital means the stock of goods that are used in the production of other goods and services and which have themselves been produced (**real capital)**. We distinguish between **fixed capital**, durable goods such as buildings, machinery, and tools, and **circulating capital**, stocks of raw materials, semi-finished goods, and components (also called **intermediate goods)** that are used up rapidly. So what determines the demand for and supply of factors of production?

Demand for Factors

The demand for a factor of production is a **derived demand** because it is determined by the demand for the goods and services which it can be used to produce. Factors of production are demanded to the extent that the products they are used to produce are demanded. If the

demand for food rises, then we would expect, *ceteris paribus*, that the demand for agricultural land and the demand for agricultural labour and other factors of agricultural production would increase.

If the price of food rises, we might reasonably expect that the payment for the use of agricultural land (rent, profits of owner-operators) would increase. Recall the profit-maximizing/ cost-minimizing production decision of the firm: the marginal cost of any factor equals the marginal revenue product of the factor (MC = MRP). For labour in a competitive market, marginal cost equals the wage rate. Marginal revenue product equals the marginal revenue of the product (which is the price in a competitive product market) multiplied by the marginal physical product of the factor. Thus,

$$w = P_{Product} \times MPP_{Labour}.$$

A firm's demand curve for a factor is derived from its marginal physical product curve (declining because of the Law of Diminishing Marginal Returns). Thus the firm's demand curve for the factor is declining. The market demand curve is the (horizontal) sum of the demand curves of all firms that potentially employ the factor.

The Price Elasticity of Factor Demand depends on a numbers of considerations:

- the rate at which the marginal product of the factor declines (technological considerations).
- the ease of substitution by/for other factors (technology and the prices of other factors).
- the significance of the factor in product cost: the larger its cost is as a share of the total cost of production, the more elastic. (Explanation: for a given percentage change in the price of the factor, the greater the factor's share of the cost of production, the greater the increase in the price of the product, the greater the drop in demand for the product, the greater the drop in demand for the factor.)
- the elasticity of demand of the product.

The last two in the list above are Marshall's principles of derived demand. Other examples of derived demand include the demand for money and the demand for foreign currency.

Supply of Factors

The supply of capital is inelastic and changes only slowly over time (short-term and long-term inelastic). Existing capital goods become economically obsolescent or physically wear out and are discarded. The rate at which new capital is created (i.e., the rate of **capital investment**) depends on the expected return on real capital and the cost of (return on) financial capital (the interest rate).

The supply of land is also inelastic, although high returns may draw some land into use (e.g., making it worthwhile to clear forested land) and low returns may result in some land being abandoned.

The supply of labour depends on individual workers' choices between good and services, on one hand, and leisure, on the other hand, the size of the population and other demographic factors.

Factor-Price Differentials

Why are there different wages/salaries for the same work at different locations?

- Temporary differentials: with separate but connected local labour markets, any wage differential that results from a one-time but permanent shift of demand or supply in one local market is temporary and soon eliminated by labour mobility. If wages for the same work are higher in Calgary than Regina (perhaps due to a growth in demand in Calgary), then workers move from Regina to Calgary, labour supply increases in Calgary and falls in Regina and wages drop in Calgary and rise in Regina until the differential is eliminated. Of course, if the cause of the market disruption continues to grow, then the wage differential will continue to exist in some amount and market adjustments will continue to occur.
- Equilibrium differentials may be created by one or more causes:
  - Variations in the cost of living. While the money wage may be different, the **real wage** may be same if the relative level of prices (particularly of consumer goods such as housing and personal taxes) differ in the same proportion.
  - Intrinsic differences, e.g. skill levels, that produce different marginal (physical) productivity.
  - Acquired differences, e.g. training or experience, that produce different marginal (physical) productivity.

- Non-monetary benefits such as attachment to home, attractive climate and other amenities of a location may result in lower wages. Disbenefits such as discomfort or danger of the worksite raise wages. Workers base their decisions on utility (not just income) and that includes both wages and non-monetary benefits and disbenefits. If in the long-term, wages in Regina wages are less than wages in Sudbury (and the costs of living and the marginal productivity of labour are the same), one can infer that Regina is a more attractive place to live.
- Stability of employment. Labour mobility results not from actual current wage differentials but expected future income differences. Thus, workers also take into consideration such matters as the probability of getting a job, of being laid-off, etc.
- Transactional costs. Small wage differentials may exist for an extended period of time because workers in lower wage markets believe that a higher wage will not cover their costs of moving, searching for a job, risking a bad fit in a new job, etc.

In the long run, we can expect that lower wages that do not reflect differences in labour productivity will induce capital to relocate to take advantage of lower costs of production if (and only if) the product can be transported back to the original market at a unit cost that is less than the savings on the wage bill per unit of production.

Economic rent

Economic rent is not rent in the usual usage but has a particular meaning for economists. **Economic rent** is the excess of total payments to a factor of production over and above its **transfer earnings** which are defined as the level of payment just sufficient to keep the factor of production in its present occupation or use (the wage or payment it would receive in the next most remunerative usage, ignoring non-monetary benefits, etc.).

Classic examples of economic rent include the salaries of baseball superstars or movie actors. But some part of their income may be return on the risk of entering that occupation (and potentially failing to make a living wage over a working lifetime: not reaching the majors, injury and disability, plus the short earning period, etc.) and a return on the human capital investment made by the successful players or actors in developing their skills.

For capital, economic rent takes the form of excess or super-normal profits. Theoretically, economic rent could be taxed away and the factor would remain in the same use/occupation. But the factor might move to another employer or jurisdiction to avoid the tax. And there are also equity issues in taxing return on risk and the other elements described above.

Non-renewable Resources

The supply of non-renewable resources (e.g. coal, minerals, old growth lumber) hinges on the owner's decision between extracting/ harvesting the resource and selling it today or leaving it in the ground (or inventories) to be sold at a later date. For the marginal unit sold in a competitive market, the amount obtained from extracting and selling it today will equal the expected present value of the amount earned from selling it one year hence. Therefore, if potential stocks are fully known and demand is stable, and extraction costs are negligible compared to the price (or rise at a rate of inflation that approximates the interest rate), then over time the equilibrium (market-clearing) price will rise annually by a percentage equal to the interest rate.

Thus a competitive market naturally leads to rising prices as a non-renewable resource is exhausted, thereby encouraging conservation, the search for new resources (exploration, replanting), and innovation through the development of substitute factors of production and resource-conserving technology.

This result relates only to the annual change in the price; the absolute level (high or low) will be determined, as in any other competitive market, on demand and supply.

Hotelling's Rule: the socially optimal rate of extraction of a non-renewable resource is the one that results in the price of the resource rising annually at a rate equal to the interest rate. A competitive market produces the socially optimal extraction rate.

This mechanism can fail for a number of reasons: lack of information on the part of resource owners, inadequate property rights and over exploitation (the tragedy of the commons), political or market instability, unequal market and social values/discount rates (particularly, a high government discount rate/rate of time preference (cf. the Hwy 407 reading).

When governments intervene to keep the price of a non-renewable resource (or a product derived from a non-renewable resource) below its free-market price, the current users or consumers obtain a subsidy at the expense of future user-consumers who, once the policy

becomes unsustainable, will eventually have to make major adjustments abruptly while enduring shortages or paying much higher prices than they would have without the previous government intervention.

Demand for a factor by a firm under marginal productivity theory

MARGINAL PRODUCTIVITY THEORY OF DISTRIBUTION: 1. The market price for a **factor** of production is determined by the supply and **demand**for that **factor**. ... **Demand** by a **firm** for a **factor** of production is the **marginal productivity** schedule of the **factor**.

Marginal Productivity Theory of Distribution: Definitions, Assumptions, Explanation!

The oldest and most significant theory of factor pricing is the marginal productivity theory. It is also known as Micro Theory of Factor Pricing.

It was propounded by the German economist T.H. Von Thunen. But later on many economists like Karl Mcnger, Walras, Wickstcad, Edgeworth and Clark etc. contributed for the development of this theory.

According to this theory, remuneration of cache factor of production tends to be equal to its marginal productivity.

Marginal productivity is the addition that the use of one extra unit of the factor makes to the total production. So long as the marginal cost of a factor is less than the marginal productivity, the entrepreneur will go on employing more and more units of the factors. He will stop giving further employment as soon as the marginal productivity of the factor is equal to the marginal cost of the factors.

Definitions:

"The distribution of income of society is controlled by a natural law, if it worked without friction, would give to every agent of production the amount of wealth which that agent creates." -J.B. Clark

"The marginal productivity theory contends that in equilibrium each productive agent will be rewarded in accordance with its marginal productivity." -Mark Blaug

"The marginal productivity theory of income distribution states that in the long run under perfect competition, factors of production would tend to receive a real rate of return which was exactly equal to their marginal productivity." -Liebhafasky

Assumptions of the Theory:

The main assumptions of the theory are as under:

1. Perfect Competition:

The marginal productivity theory rests upon the fundamental assumption of perfect competition. This is because it cannot take into account unequal bargaining power between the buyers and the sellers.

2. Homogeneous Factors:

This theory assumes that units of a factor of production are homogeneous. This implies that different units of factor of production have the same efficiency. Thus, the productivity of all workers offering the particular type of labour is the same.

3. Rational Behaviour:

The theory assumes that every producer desires to reap maximum profits. This is because the organizer is a rational person and he so combines the different factors of production in such a way that marginal productivity from a unit of money is the same in the case of every factor of production.

4. Perfect Substitutability:

The theory is also based upon the assumption of perfect substitution not only between the different units of the same factor but also between the different units of various factors of production.

5. Perfect Mobility:

The theory assumes that both labour and capital are perfectly mobile between industries and localities. In the absence of this assumption the factor rewards could never tend to be equal as between different regions or employments.

6. Interchangeability:

It implies that all units of a factor are equally efficient and interchangeable. This is because different units of a factor of production are homogeneous, since they are of the same efficiency, they can be employed inter-changeable, and e.g., whether we employ the fourth man or the fifth man, his productivity shall be the same.

7. Perfect Adaptability:

The theory takes for granted that various factors of production are perfectly adaptable as between different occupations.

8. Knowledge about Marginal Productivity:

Both producers and owners of factors of production have means of knowing the value of factor's marginal product.

9. Full Employment:

It is assumed that various factors of production are fully employed with the exception of those who seek a wage above the value of their marginal product.

10. Law of Variable Proportions:

The law of variable proportions is applicable in the economy.

11. The Amount of Factors of Production should be Capable of being Varied:

It is assumed that the quantity of factors of production can be varied i.e. their units can either be increased or decreased. Then the remuneration of a factor becomes equal to its marginal productivity.

12. The Law of Diminishing Marginal Returns:

It means that as units of a factor of production are increased the marginal productivity goes on diminishing.

13. Long-Run Analysis:

Marginal productivity theory of distribution seeks to explain determination of a factor's remuneration only in the long period.

Explanation of the Theory:

The marginal productivity theory states that under perfect competition, price of each factor of production will be equal to its marginal productivity. The price of the factor is determined by the industry. The firm will employ that number of a given factor at which price is equal to its marginal productivity. Thus, for industry, it is a theory of factor pricing while for a firm it is a factor demand theory.

Analysis of Marginal Productivity Theory from the Point of View of an Industry:

Under the conditions of perfect competition, price of each factor of production is determined by the equality of demand and supply. As the theory assumes that there exists full employment in the economy, therefore, supply of the factor is assumed to be constant. So, factor price is

determined by its demand which itself is determined by the marginal productivity. Thus, under such conditions, it becomes essential to throw light on the demand curve or marginal productivity curve of an industry.

As the industry consists of a group of many firms, accordingly, its demand curve can be drawn with the demand curves of all the firms in the industry. Moreover, marginal revenue productivity of a factor constitutes its demand curve. It is only due to this reason that a firm's demand or labour depends on its marginal revenue productivity. A firm will employ that number of labourers at which their marginal revenue productivity is equal to the prevailing wage rate.

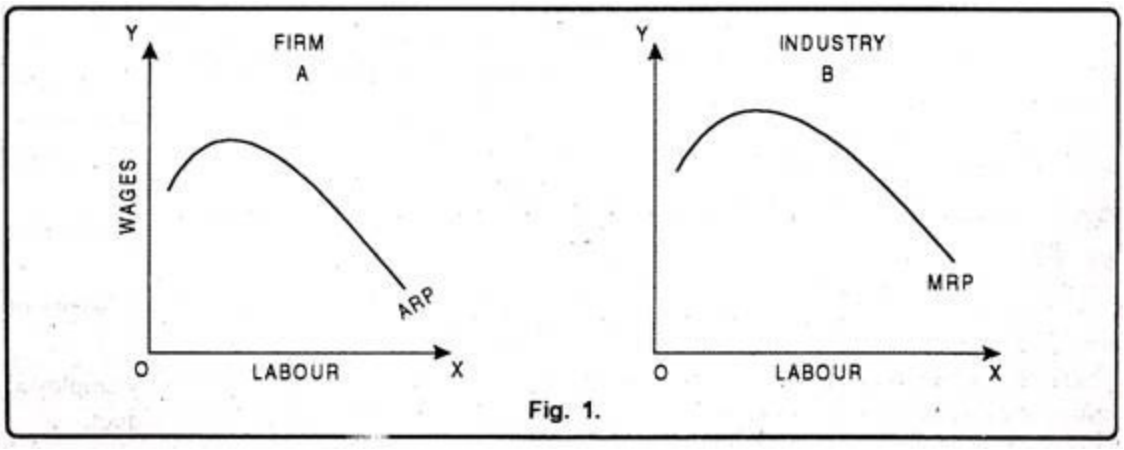


Fig. 1.

Fig. 2 shows that at wage rate OP_1, the demand for labour is ON_1 and marginal revenue productivity curve is MRP_1. If wage rate falls to OP, firms will increase production by demanding more labour. In such a situation the price of the commodity will fall and marginal revenue productivity curve will also shift to MRP_2.

At OP wages, the demand for labour will increase to ON. DD_1 is the firm's demand curve for labour. The summation of demand of all the firms shows demand curve of an industry. Since the number of firms is not constant under perfectly competitive market, it is not possible to estimate the summation of demand curves of all firms. However, one thing is certain that is the demand curve of industry also slopes downward from left to right. The point where demand for and supply of a factor are equal will determine the factor price for the industry. This theory assumes the supply of a factor to be fixed.

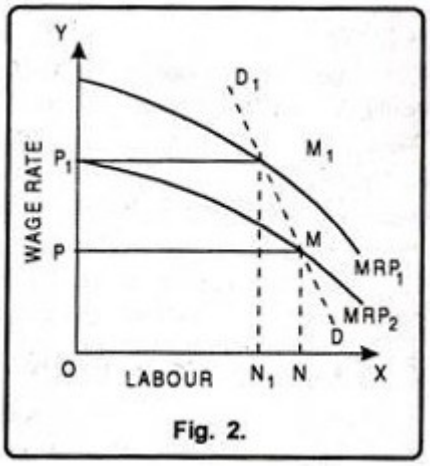


Fig. 2.

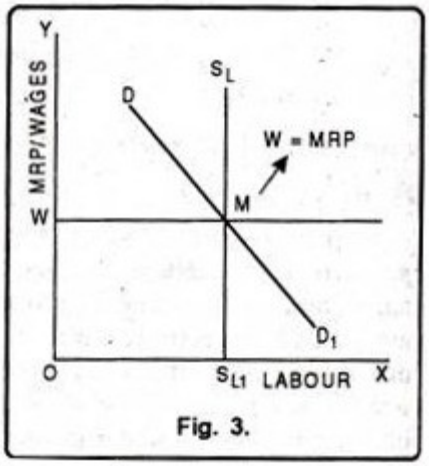


Fig. 3.

Thus factor price is determined by the demand for factor i.e. factor price will be equal to the marginal revenue productivity. It has been shown by Fig. 3. In the Fig. 3, number of labour has been taken on OX axis whereas wages and MRP have been taken on OY axis. DD_1 is the industry's demand curve for labour. This is also the Marginal Revenue Productivity curve.

Factor Price (OW) = Marginal Revenue Productivity MRP.

Thus under perfect competition, factor price is determined by the industry and firm demands units of a factor at this price.

Analysis of Marginal Productivity Theory from the Point of View of Firm:

Under perfect competition, number of firms is very large. No single firm can influence the market price of a factor of production. Every firm acts as a price taker and not a price maker. Therefore, it has to accept the prevailing price. No employer would like to pay more than what others are paying. In other words, a firm will employ that number of a factor at which its price is equal to the value of marginal productivity. Therefore, from the point of view of a firm, the theory indicates how many units of a factor it should demand.

It is due to this reason that it is also called Theory of Factor Demand. Other things remaining the same, as more and more labourers are employed by a firm, its marginal physical productivity goes or- diminishing. As price under perfect competition remains constant, so when marginal physical productivity of labour goes on diminishing, marginal revenue productivity will also go on diminishing. Therefore, in order to get the equilibrium position, a firm will employ labourers up to a point where their respective marginal revenue productivity is equal to their wage rate.

Table 2. Factor Demand by the Firm

Labourer	MPP	Price of Product	MRP (MPP × MR)	Wage Rate
1.	20	5	20 × 5 = 100	55
2.	17	5	17 × 5 = 85	55
3.	14	5	14 × 5 = 70	55
4.	11	5	11 × 5 = 55	55
5.	8	5	8 × 5 = 40	55

Table 2 indicates that wage rate of labour is Rs. 55 per labourers. Price of the product produced by the labourer is Rs. 5 per unit. Now, when a firm employs one labourer, his marginal physical productivity is 20 units. By multiplying the MPP with price of the product we get marginal revenue productivity. Here, it is Rs. 100 for the first labour. The marginal revenue productivity of second labourer is Rs. 85 and of third labourer it is Rs. 70.

The marginal revenue productivity of fourth labourer is Rs. 55 which is equal to wage rate. The firm will earn maximum profits if it employs up to the fourth labourer. If the firm employs fifth

labourer, it will have to suffer losses of Rs. 15. Therefore, to get maximum profits, a firm will employ a factor upto a point where MRP is equal to price.

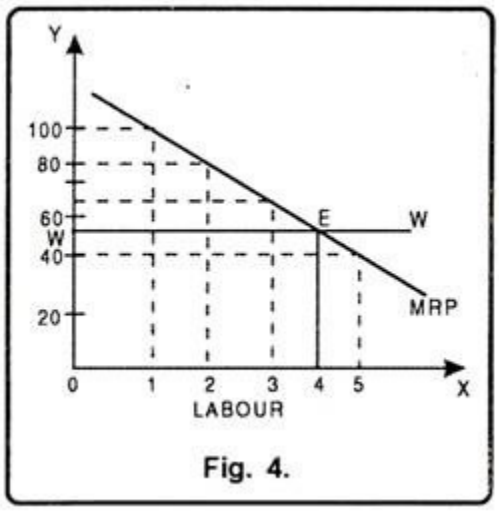


Fig. 4.

In Fig. 4 number of labourers has been measured on OX-axis and wage rate on Y-axis. MRP is marginal revenue productivity curve and WW is the wage rate prevailing in the market. Since, under perfect competition wage rate will remain constant that is why WW wage line is parallel to OX-axis.

MRP curve is sloping down-ward. It cuts WW at point E which is the equilibrium wage rate of Rs. 55. At point E, firm will demand only four labourers. Thus, from the above, we can conclude that a factor is demanded up to the limit where its marginal productivity is equal to prevailing price.

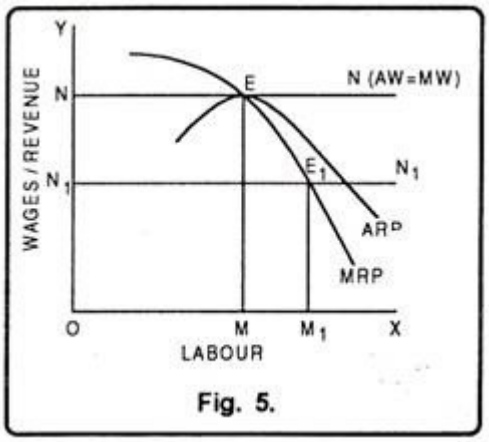


Fig. 5.

Under perfect competition, in long period in the equilibrium position, not only the marginal wages of a firm are equal to marginal revenue productivity, even the average wages of the firm are equal to average net revenue productivity as has been shown in Fig. 5. The fig. 5 shows that at point 'E' marginal wages of labour are equal to marginal revenue productivity and the firm employs OM number of workers. At this point, even the average net revenue productivity is equal to average wages. Thus firm earns only normal profit. If wage line shifts from NN to N[N] then the demand for labour increases from OM to OM_1.

Determination of Factor Pricing under Imperfect Competition:

Marginal productivity theory applies to the condition of perfect competition. But in real life we face imperfect competition. Therefore, economists like Robinson, Chamberlin have analyzed factor pricing under imperfect competition. There are various firms under imperfect competition. But here we shall analyze only Monopsony. Under monopsony, there is perfect competition in product market. Consequently MRP is equal to VMP. There is imperfect competition in factor market.

It indicates that there is only one buyer of the factors. Therefore, monopsony refers to a situation of market where only a single firm provides employment to the factors. If the firm demands

more factors, factor price will go up and vice-versa. However, the determination of factor price under monopsony can be explained with the help of Fig. 6.

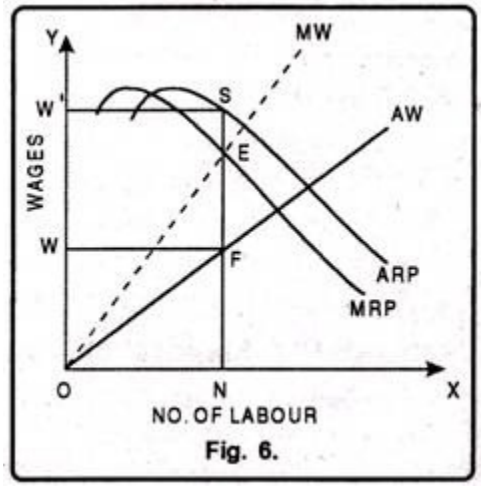


Fig. 6.

In Fig. 6 number of labourers has been shown on X-axis and wages on Y-axis. MW is marginal wage curve and ARP is the average wage curve. MRP is the marginal revenue productivity curve and AW is the average revenue productivity curve.

In the fig. 6 a monopsony will employ that number of labourers at which their marginal wage is equal to MRP. In the fig. 6 firm is in equilibrium at point E. Here, firm will employ ON labourers and they will be paid wages equal to NF. In this way, ON labourers will get less wages than their MRP i.e. EN. Monopsony firm will have EF profit per labourer which arises due to exploitation of labourers. Total profit SFWW' is due to exploitation of labour.

Criticisms of the Theory:

The marginal productivity theory of distribution has been subjected to a number of criticisms:

1. In determination of marginal product:

Firstly, main product is a joint product— produced by all the factors jointly. Hence the marginal product of any particular factor (say, land or labour) cannot be separately determined. As William

Petty pointed out as early in 1662: Labour is the father and active principle of wealth, as lands are the mother.

2. Unrealistic:

It is also shown that the employment of one additional unit of a factor may cause an improvement in the whole of organisation in which case the MPP of the variable factors may increase. In such circumstances, if the factor is paid in accordance with the VMP, the total product will get exhausted before the distribution is completed. This is absurd. We cannot think of such a situation in reality.

3. Market imperfection:

The theory assumes the existence of perfect competition, which is rarely found in the real world. But E. Chamberlin has shown that the theory can also be applied in the case of monopoly and imperfect competition, where the marginal price of a factor would be equal to its MRP (not to its VMP).

4. Full employment:

Again, the assumption of full employment is also unrealistic. Full employment is also a myth, not a reflection of reality.

5. Difficulties of factor substitution:

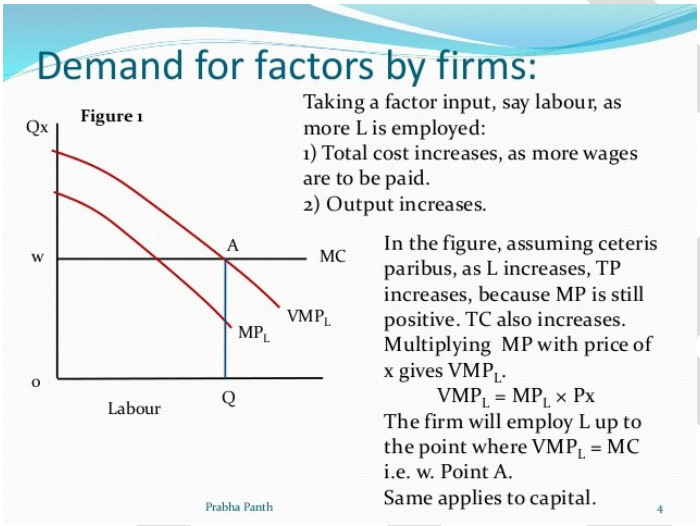
W. W. Leontief, the Nobel economist, denies the possibility of free substitution of the factors always owing to the technical conditions of production. In some products process, one factor cannot be substituted by another. Moreover organisation or entrepreneurship is a specific factor which cannot be substituted by any other factor.

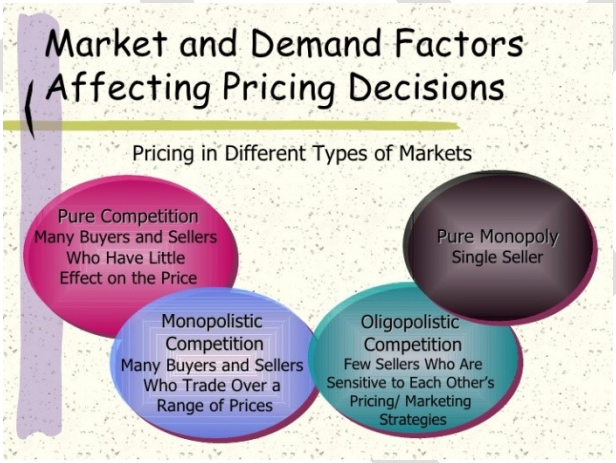
6. Emphasis on the demand side only:

The theory is one-sided as it ignores the supply side of a factor; it has emphasised only the demand side i.e., the employer's side, hi the opinion of Samuelson, the marginal productivity theory is simply a theory of one aspect of the demand for productive services by the firm.

7. Inhuman theory:

Finally, the theory is often described as 'inhuman' as it treats human and non-human factors in the same way for the determination of factor prices.





Market demand for a factor supply of labour

Labor **Demand** and **Supply** in a Perfectly Competitive**Market**. ... The **demand** and **supply** of labor are determined in the labor **market**. The participants in the labor **market** are workers and firms. Workers **supply**labor to firms in exchange for wages.

Although labour has certain peculiarities and cannot be regarded as a commodity, still wages are very largely determined by the interaction of the forces of demand and supply.

Demand for Labour:

The demand for labour is a derived demand. It is derived from demand for the commodities it helps to produce. The greater the consumers' demand for the product, the greater the producers' demand for the labour required in making it. Hence an expected increase in the demand for a commodity will increase the demand for the type of labour that produces this commodity.

The elasticity of demand for labour depends, therefore, on the elasticity of demand for its output. Demand for labour will generally be inelastic if their wages form only a small proportion of the total wages. The demand, on the other hand, will be elastic if the demand for the commodity it produces is elastic or if cheaper substitutes are available.

The demand for labour also depends on the prices of the co-operating factors. Suppose the machines are costly, as is the case in India, obviously more labour will be employed. The demand for labour will increase. Another factor that influences the demand for labour is the technical progress. In some cases, labour and machinery are used in a definite ratio. For instance, the introduction of automatic looms reduces the demand for labour.

After considering all relevant factors, e.g., demand for the products, technical conditions, and the prices of the co-operating factors, the wages are governed by one fundamental factor, viz., marginal productivity. Just as there is a demand price of commodities, so there is a demand price for labour.

The demand for labour, under typical circumstances of a modern community, comes from the employer who employs labour and other factors of production for making profits out of his business. The demand price of labour, therefore, is the wage that an employer is willing to pay for that particular kind of labour.

Suppose an entrepreneur employs workers one by one. After a point, the law of diminishing marginal returns will come into operation. Every additional worker employed will add to the total net production at a decreasing rate. The employer will naturally stop employing additional workers at the point at which the cost of employing a worker just equals the addition made by him to the value of the total net product.

Thus, the wages that he will pay to such a worker (the marginal unit of labour) will be equal to the value of this additional product or marginal productivity. But since all the workers may be assumed to be of the same grade, what is paid to the marginal worker will be paid to all the workers employed. This is all about the demand side of labour. Now let us consider the supply side.

Supply of Labour:

By the supply of labour, we mean the various numbers of workers of a given type of labour which would offer themselves for employment at various wage rates.

The supply of labour may be considered from two view-points?

(a) Supply of labour to the industry and

(b) Supply of labour to the entire economy.

For an industry, the supply of labour is elastic. Hence, if a given industry wants more labour, it can attract it from other industries by offering a higher wage. It can also work the existing labour force over-time. This in effect will mean an increase in supply. The supply of labour for the industry is subject to the law of supply, i.e., low wage, small supply and high wage, large supply. Hence, the supply curve of labour for an industry rises upwards from left to right.

The supply of labour for the entire economy depends on economic, social and political factors or institutional factors, e.g., attitude of women towards work, working age, school and college leaving age and possibilities of part-time employment for students, size and composition of the

population and sex distribution, attitude to marriage, the size of the family, birth control, standard of medical facilities and sanitation, etc.

The supply of labour may be decreased by workers refusing to work for a time. This happens when labour is organised into trade unions. The workers may not accept wages offered by the employer if such wages do not ensure the maintenance of a standard of living to which they are accustomed.

But, as we shall see, it is only when higher wages are justified by higher marginal productivity that high wages will be paid. Thus, workers with low marginal productivity cannot demand high wages merely on the basis of their standard of living. On the whole, we might say that, the number of potential workers being given, the supply of labour may be defined as the schedule of units of labour at the prevailing rates of wages.

This depends on two factors:

(a) The number of workers who are willing and able to work at different wages;

(b) The number of working hours that each Worker is willing and able to put in at different wages.

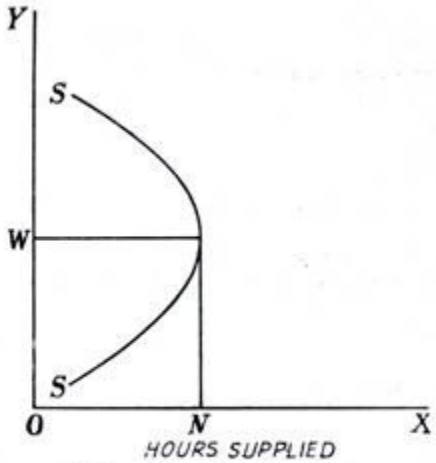
In case the workers have no staying power and the only alternative to work is starvation, the supply of labour in general will be perfectly inelastic. This means that wages can he driven down. Over a short period, reduction in wages may not cause any reduction in the supply of labour. For any industry over a long period, the supply curve will slope upwards from left to right. In other words, supply will be somewhat elastic in the long run.

Backward Sloping Supply Curve of Labour:

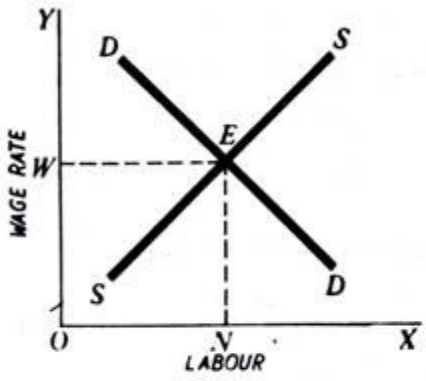
While labour's supply curve sloping upwards from left to right is the general rule, an exceptional case of labour's supply curve may also be indicated (see Fig. 31.1) When the workers' standard of living is low, they may be able to satisfy their wants with a small income and when they have

made that much, they may prefer leisure to work. That is why it happens that, sometimes, increase in wages leads to a contraction of the supply of labour. This is represented by a backward-sloping supply curve as under.

For some time this particular individual is prepared to work long hours as the wage goes up (wage is represented on OY—axis in Fig. 31.1). But beyond OW wage, he will reduce rather than increase his working hours.



Backward Bending Supply Curve of Labour

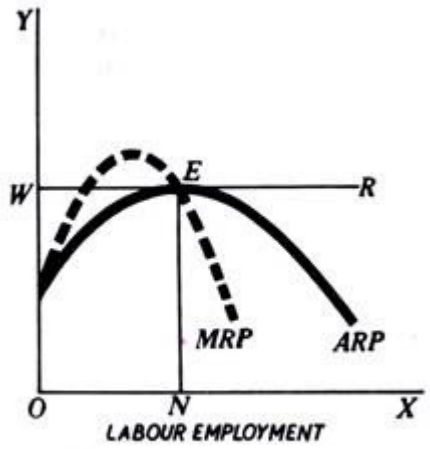


Determination of Wages
Fig. 31.1

However, this backward sloping Curve may sometimes be true of certain workers, the supply curve of labour to industry as a whole will normally slope upwards from left to right (as shows in Fig. 31.2)

Interaction of Demand and Supply:

We have now analysed the demand side as well as the supply side of labour. We shall now see how their interaction determines the wage level. This is shown in Fig. 31.2



Long-run Equilibrium Wage-rate
Fig. 31.2

In this diagram, we have shown the wage determination of a particular type of labour for an industry. The curve SS represents supply of labour to the industry. DD is the demand curve for labour of that industry. Demand and supply curves intersect at E. Therefore, the wage rate OW (= NE) will be established. The equilibrium wage rate will change if the demand and/or supply conditions change.

Under competitive conditions, wage rate in the long run will be equal to both the marginal revenue product and the average revenue product. If the wage rate is less than the average revenue product, the firms would be earning supernormal profits. As a result, new firms will enter the industry and the demand for labour will increase which will push up the wage rate so as to be equal to average revenue product.

On the other hand, if the wage rate is above the average revenue product, the firms will be suffering losses. As a result, some firms will leave the industry and demand for labour will decrease which will force the wage-rate down. Fig. 31.2 shows the long-run equilibrium of the firms under perfect competition. This diagram shows that long-run equilibrium wage rate is OW. At wage rate OW, the firm is employing ON number of labour. This OW rate is equal to marginal revenue product (MRP) and average revenue product (ARP) at point E. The point E is the equilibrium position of the firm in the long run.

We have so far concerned ourselves with the problem of how wages in general are determined. But is there any general rate of wages?

If labour had been like any other commodity, it would also have been sold in the market at the same rate. But as you know, labour is peculiar in certain respects. Labourers differ in efficiency. They are less mobile than goods. Their supply cannot be increased to order and it is a most painful process to reduce I hem. If a day is lost, its labour is lost with it. For these and other reasons, a uniform rate of earnings for workers is not possible. There is thus no prevailing rate of wages similar to the prevailing rate of interest or prevailing price of a good.

All over the world, labour is spat up into a very large number of groups and sub-groups, each with a different level of wages. Even within the same group, the differences are ever so many. Consequently there cannot possibly be a general rate of wages. All that can be done is to and out an average rate which can be discovered by dividing the total amount paid to a given group of workers by the total number of workers in it. The fact is that the wages differ from occupation to occupation. Wages are relative.

Market supply of labour

Perfectly competitive **labour markets** and their **supply of labour** curves. ... The situation is similar in a perfectly competitive **labour market**. The going wage is determined in the **market** and no one firm can affect this given wage through its actions. But, each firm can employ as many workers as it wants at this given wage.

The **labour supply** is the number of hours people are willing and able to supply at a given wage rate

- It is the number of workers willing and able to work in a particular job or industry for a given wage
- The labour supply curve for any industry or occupation will be upward sloping. This is because, as wages rise, other workers enter this industry attracted by the incentive of higher rewards. They may have moved from other industries or they may not have previously held a job, such as housewives or the unemployed
- The extent to which a rise in the prevailing wage or salary in an occupation leads to an expansion in the supply of labour depends on the elasticity of labour supply.

Key factors affecting labour supply

1.**The real wage rate on offer in the industry itself** – higher wages raise the prospect of increased factor rewards and should boost the number of people willing and able to work

2.**Overtime:** Opportunities to boost earnings come through overtime payments, productivity-related pay schemes, and share option schemes

3.**Substitute occupations:** The real wage rate on offer in competing jobs affects the wage and earnings differential that exists between two or more occupations. For example an increase in the earnings available to trained plumbers and electricians may cause some people to switch their jobs

4. Barriers to entry: Artificial limits to an industry's labour supply (e.g. through the introduction of minimum entry requirements) can restrict labour supply and force pay levels higher – this is the case in professions such as legal services and medicine where there are strict "entry criteria"

5.**Improvements in the occupational mobility of labour:** For example if more people are trained with the necessary skills required to work in a particular occupation.

6.**Non-monetary characteristics of specific jobs** – include factors such as the risk with different jobs, the requirement to work anti-social hours or the **non-pecuniary benefits**that certain jobs provide including **job security**, **working conditions,** opportunities for promotion and the chance

to live and work overseas, employer-provided in-work training, employer-provided or subsidised health and leisure facilities and other in-work benefits including occupational pension schemes.

7.**Net migration of labour** – the UK is a member of the European Union single market that enshrines free movement of labour as one of its guiding principles. A rising flow of people seeking work in the UK is making labour migration an important factor in determining the supply of labour available to many industries – be it to relieve shortages of skilled labour in the NHS or education, or to meet the seasonal demand for workers in agriculture and the construction industry.

Factors affecting supply of labour

The supply of labour is affected by numerous factors including the **wage rate**, **migration patterns**, changes in **income** tax, benefit reform, trade unions, government labour regulations, changes in the retirement **age** and female participation in the workforce.

In every economic field the market of labour is affected by the demand and supply powers. The supply of labour is considered on the basis of population, different age groups, participation of sex ratio and their education.

Supply of labour is related with that quantity and rate at which the labourers are ready to work.

According to Rees following are four factors which affect the supply of labour: 1. Participation Rate as Labour Force 2. Number of Hours the Labourers is Willing to Work 3. Speed or Intensity of Work 4. Efficiency or Skill of Work.

Factor # 1. Participation Rate as Labour Force:

Normally the number of labourers is based on the population. How much percentage does really work. It depends on the persons of 14 to 60 years age which is totally based on the ratio of population.

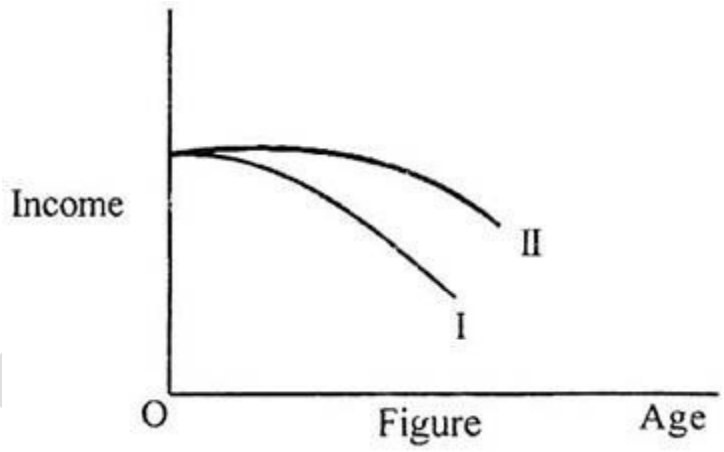
The industrialised countries prove that:

(i) When there is progress in national income, and

(ii) High age people comparatively stop the work at low age.

As for the question of first stage, the real reason is increasing at the level of education. For second stage, keeping the social security in mind they do not want to do the work after retirement. In under developed economy the quantity of aged labourers is always low in both agricultural and industrial sector.

As per the diagram, it is clear that in under developed countries, there is a rapid decline of average life time earning profile of labours in comparison to developed countries. According to Standing, **"In the early stages, there is a fairly rapid decline in the participation rates of the youngest and oldest age groups; but once those declines have taken place any subsequent decline in the overall, or crude male participation rate is slight."**



Figure

In this figure, on the basis of imagination, the average life time earning profiles is drawn where (I) is for under developed countries, and (II) for developed countries.

In the Indian economy the participation of Labour power is shown on the basis of received data of census.

In the following table the data are given from 1901 to 1981:

Workers—Population Ratio

Year	Labour force	Male	Female
1901	46.8	60.8	31.7
1911	48.1	62.0	33.7
1921	46.9	60.4	32.6
1931	43.8	58.1	28.8
1951	39.1	53.9	23.4
1961	43.1	57.3	28.0
1971	34.2	52.7	14.2
1981	37.5	52.2	20.8

Source: Study material, H.P. University

Pandey searched the reasons of difference of participation rate regarding workers. He assumed the size of work field, literacy rate, sex ratio, increase in population rate and the participation ratio of women. According to Pandey's analysis there is a proper impact of literacy rate, increase in population rate and women participation rate on all over the participation of city. But he did not stress on the participation rate of rural areas.

According to Pandey increase in employment and income inspires the rural people. Especially children, ladies and old people remove them from effective labour power. Reddy has analysed the participation of women to work in the rural areas. According to Reddy the average income of men who are involved in agriculture sector affects the participation of ladies in work. The ladies whose husbands are working in industrial sector their participation ratio is low.

Factor # 2. Number of Hours the Labourers is Willing to Work:

The second aspect of supply of labour is hours of work or time. Supply of labour cannot be determined without knowing that how many hours the work is done. The working hours have been reduced with the movement in labour organisations and the supply has been affected.

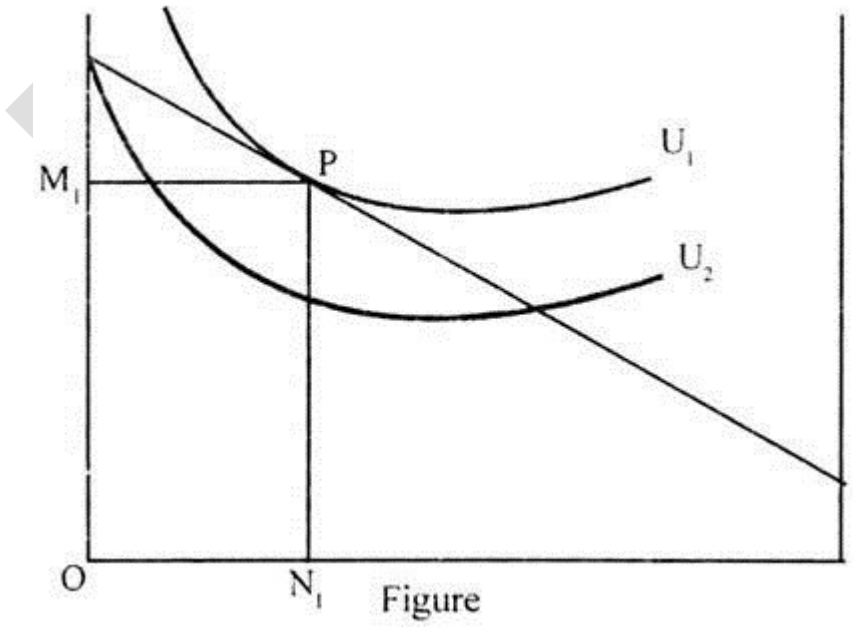
Due to this change, the supply of labour will automatically be changed. The supply became low when the working hours are increased and if the hours are decreased the supply will increase.

We are taking some assumptions to study the working population of supply of labour:

(a) There is a difference between market work and non- market activities.

(b) In both works the decision for allotment of time is taken on personal basis.

On the above assumptions in the market work and non-market activities, the utility maximization tendency solution of person is balanced through the budget constraint. It can be seen by this diagram.



Figure

Utility Maximisation Tendency Solution:

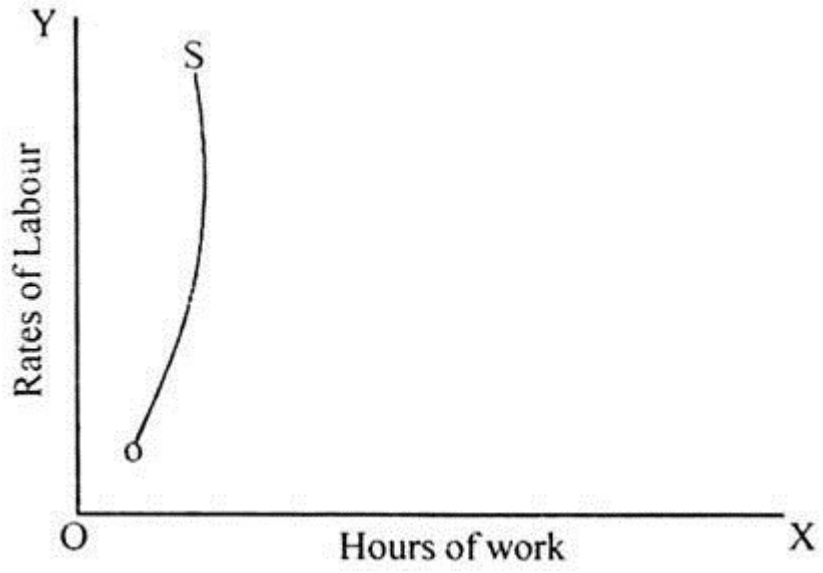
On OM axis the utility received from market work is shown and on ON axis the utility received from non-market work is shown. Market and non-market work describes the level of satisfaction.

On the level of satisfaction utility curve (U_1) shows the negative trend that the deficiency received from the market work can be set by getting the excess progress made in non-market sector. Or it can be reciprocal. U_1 curve shows the low utility level and U_1 curve shows the high utility level.

Maximum utilization state is shown by budget line AB and utilization curve is shown by U_1, which touches at point P.

Now we will differentiate between enterprises and effect of Income due to the increase in labour rate under market activities. Increase in market activities relates with the increase in the labour rate and in this way there will be increase in market activities.

Side by side due to increase in labour rate there will be increase in real income of person, which he will spend on non-market activities. In this way, increase in labour rate will affect the market activities in both ways. When income impact is more powerful than subsidiary effect then curve of labour will be seen high up from left to right. It can be seen from the following picture.



Factor # 3. Speed or Intensity of Work:

Speed of work controls the quantity of labour. One labour who works at a double speed completes the supply of other labourer. This speed depends on various factors. Education, health, climate and others put impact on this tendency of work. We can change the speed knowingly.

Factor # 4. Efficiency or Skill of Work:

Skill of work is related with the kind of work that how much wastage is done, how many accidents are committed and many other factors are considered to know the efficiency of work.

Prof. Wilbut Boor has put the four factors in to a formula which are number of workers. Hours of work, Speed of work and skill of work.

Productivity of labour = N × H × T × S

Where,

N = Number of workers

H = Hours of work

T = Time taken for work

S = Skill of work

Among the above factors, if there is increase in any factor, there will be increase in productivity. In the modern time some new factors has been introduced like increase in number of workers, increase in the skill of work but there is a decrease in the time of work.

As far as the supply curve is concerned, in a business firm or industry under sort term the curve of labour supply remain upward rising. In the long term the curve will be downward but its curve will be less than upward. In the developed countries the supply curve will be in a position of leisure and looks backward bending.

In under developed countries, such supply curve looks as same due to institutional pressure. Except this in underdeveloped countries, in some areas of social development it is found completely flexible in the primary steps.

On this hypothesis we will think that in developed countries the curve of Labour supply is very flexible especially in agricultural sector. This hypothesis is attached with the name of Lewis which is developed by Fei and Rains.

According to Lewis:

1. In many economies the life strategy of wages is based on the unlimited supply of labour.

2. In such economies labourers, agriculture, casual labour, petty trade, domestic services are received. In most of the area's population is more than the resources.

3. Such economies, in the capitalistic sector employment are increased when there is increase in capital formation.

4. In capital formation and industrial progress the portion of profit in national income increased but there is no increase in the wages.

In India, under Five year plans the labour power, and unemployment is estimated on the basis of usual status concept, weekly status concept and on daily status concept.

factor market equilibrium

For **factor markets** that are not perfectly competitive, such as those controlled by monopoly or monopsony, **factor market equilibrium** is achieved when the controlling firm maximizes profit. For monopoly, this is the **factor** quantity that equates marginal revenue and marginal cost.

Equilibrium of a Firm in Factor Market: Perfect Competition and Imperfect Competition!

When an organization decides to hire a factor of production, it makes comparison between MRP of the factor with that of its Marginal Factor Cost (MFC).

If the MRP is greater than the marginal cost of factor (MRP>MC), then the factor is employed because it would generate more marginal revenue.

On the other hand, when MRP is lesser than the marginal cost of factor (MRP<MC), then the organization would not employ the factor as it would increase costs. In case, the MRP is equal to the marginal cost of factor (MRP=MC), then the organization would attain equilibrium.

However, in modern times, the organizations determine the actual amount of factors that are required to achieve equilibrium. For determining the equilibrium point, it is necessary for an organization to analyze the factor market in different market structures, such as perfect competition and imperfect competition. Let us discuss the equilibrium of a firm in different market structures.

Equilibrium in Factor Market: Perfect Competition:

In the factor market, under perfect competition, an individual organization cannot affect the prices of a factor of production by increasing or decreasing its consumption.

This is because the quantity demanded by an organization of a particular factor is very small as compared to the market demand. In such a case, the organization cannot affect the price of the

factor, thus it has to purchase the factor at the prevailing market price. Even if the organization increases the consumption of the factor, the price of the factor would remain same.

For example, in perfect competition, organizations need to pay wages to its employees according to the wage rates prevailing in the market. Similarly, if we look upon the supply side, a single supplier does not have ample amount of products to meet the demand of all the customers in the market. Therefore, in perfect competition, marginal product (MP) and average product (AP) are same and their curves would intersect each other. Thus, MP and AP would form a straight horizontal line. Here, we would again take the example of labor and wages to understand equilibrium in factor market under perfect competition.

Figure-5 shows the equilibrium in the factor market under perfect competition:

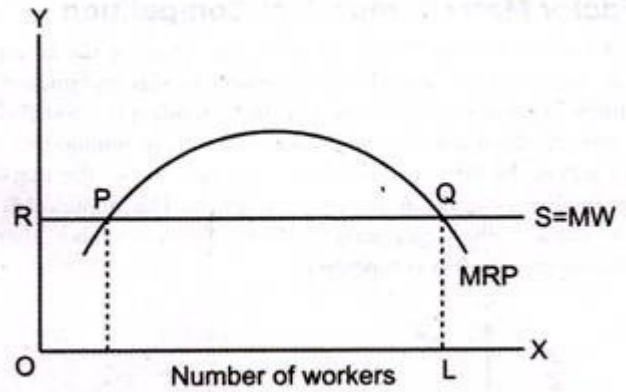


Figure-5: Equilibrium in Perfect Competition

In Figure-5, we have assumed labor as a variable factor, while keeping the other factors at constant. The RS line shows the marginal wage rate. In the factor market, all organizations can hire any number of workers at the prevailing price OR. The MRP curve of labor intersects the line RS at two points P and Q.

An organization cannot attain equilibrium at point P because at this point the number of workers employed is increased. Thus, in this case, the MRP of labor would be higher than the marginal wage OR. On the other hand, at point Q, when the organization employs OL number of workers, the MRP of labor is equal to its marginal cost.

Therefore, the organization would attain its equilibrium at point Q. Apart from this, if the organization employs more than OL workers, the marginal cost of labor would exceed MRP. In such a case, the organization would incur losses.

In summation, there are two conditions required for attaining equilibrium in the factor market under perfect competition, which are as follows:

i. MRP = MFC

ii. MRP curve intersects marginal cost from above (as shown in Figure-5)

However, from Figure-5, we cannot determine whether the organization would earn profit or incur loss.

This can be determined with the help of Figure-6:

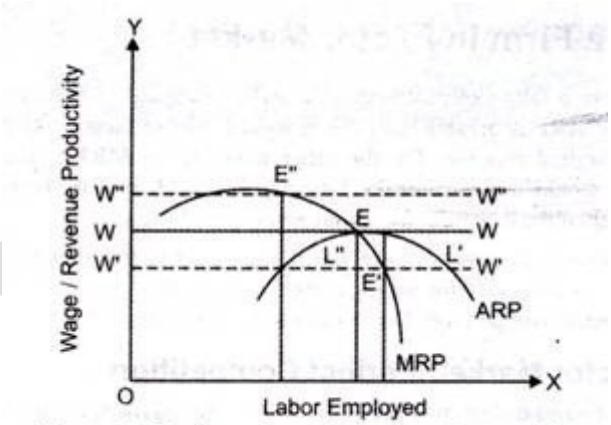


Figure-6: Profit or Loss in Perfect Competition

In Figure-6, MRP intersects Average Revenue Productivity (ARP) at point E. When the wages are at level OW the equilibrium point is attained at E'. On the other hand, when the wages are at level OW", equilibrium point is achieved at point E". At point E', extra profit is E'L', which is in the short run only.

In the long run, supernormal profit attracts new organizations to enter the market. This increases the demand for labor; therefore, the wage level of labor also increases and reaches OW. At OW

wage level, the equilibrium shifts to E and supernormal profit disappears. This is because wages are equal to average revenue productivity.

However, at equilibrium point E", the wages are more than the average revenue productivity. In such a case, the organization would incur losses. In case of losses, many organizations would leave the market, which would result in the reduction of labor and wage rates. This again brought the wage level at OW and equilibrium point at E. At this point, MRP would become equal to ARP.

Equilibrium in Factor Market: Imperfect Competition:

In the above, we have discussed the equilibrium of an organization in the factor market under perfect competition. However, in the real world, the factor market is imperfect. Therefore, we would learn the equilibrium of an organization in the factor market under imperfect competition.

For understanding the equilibrium in case of imperfect competition, we would take the case of monopsony. In monopsony, there is only one buyer of factors of production and a large number of sellers. In this case, there is no competitor in the market who wants to buy the factors of production.

Therefore, the single buyer has a control on the price of factors. This implies that he/she can bargain for the prices of factors as per his/her choice. For example, if the buyer wants to hire a factor say labor, then he/she can set wages according to him/her.

Figure-7 shows the equilibrium in imperfect competition:

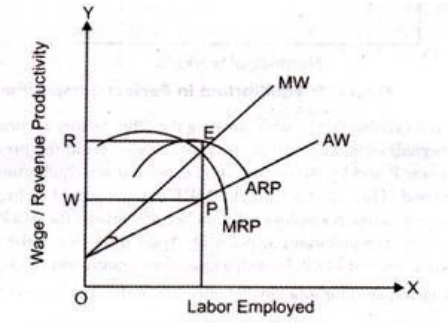


Figure-7: Equilibrium in Imperfect Competition

In Figure-7, Average Wage (AW) curve moves from left to right in upward direction and Marginal Wage (MW) curve is above the AW curve. In imperfect competition, equilibrium can be attained when MW is equal to MRP. In present case, equilibrium is at point E.

At point E, AW is NP and MRP is EN and NP is less than EN. This shows that services provided by labor is more than wages provided by the organization to them. In other words, the labor is exploited by the organization. This is also termed as monopolistic exploitation.

In imperfect competition, as the buyer has the power to decide the wages of labor; therefore, labor is exploited in this type of market structure. For example, in case of oligopoly or monopoly, the number of job opportunities is limited and the unemployment is high. In such cases, the labor is ready to work even at low wage rates.

POSSIBLE QUESTIONS : PART – B

1. What is meant by factor market?
2. When is Price Discrimination possible?
3. Write a short note on supply of labour ?
4. Define the term Perfect Competition.
5. List out the features of monopoly competition?
6. Define the term Market equilibrium?
7. List out the factors of labour supply?
8. Write any two difference between Perfect and Monopoly competition?
9. What do you mean by demand factor?
10. Write a short note on market demand?

***CIA – 3 X 2 = 6 Marks**
****ESE – 5 X 2 = 10 Marks**

PART – C

1. Explain the demand for a factor by a firm under marginal productivity theory?
2. Elaborate the term Factor Market Equilibrium?
3. Enumerate the term Market supply of Labour
4. Discuss the demand for a factor by a firm under marginal productivity theory?
5. How Prices are fixed under Factor Market Equilibrium?
6. Elaborate the comparison between Perfect and Monopoly in the product market?
7. Determine the Market demand for a factor and supply of labour?
8. Enumerate the various assumptions of the factor market theory?
9. Explain the Analysis of Marginal Productivity Theory from the Point of View of an Industry?
10. Determine the Key factors affecting labour supply?

***CIA – 3 X 8 = 24 Marks (EITHER OR TYPE)**
****ESE – 5 X 6 = 30 Marks (EITHER OR TYPE)**

Unit – V : National Income Analysis – Theories of Income, Output and Employment – Classical – Keynesian Theory – Theory of Trade Cycle – Concept and Causes of Trade Cycle – Measures to Control Trade Cycle – Macro Economic Policy – Monetary and Fiscal – Theories of Inflation – Causes and Control of Inflation

The term National Income is used to refer the money value of the total income of the economy in a year. In common parlance national income means the total value of goods and services produced annually in a country. In other words the total amount of income accruing to a country from economics activities in a year's time is known as national income. Firstly it measures the market value of annual product. Secondly National income is a monetary measure. Thirdly national income includes the market value of all final goods the value of intermediate products are not included. A final product is one which is available for immediate consumption. For example, a shirt or a sewing machine. The example of intermediate product is raw materials.

DEFINITIONS OF NATIONAL INCOME

The definitions of National income can be grouped into two classes as the traditional definition advanced by Marshall, Pigou and Fisher and the modern definitions. ***Marshallion Definition:-*** According to Marshall, the labour and capital of a country acting on its natural resources produce annually a certain net aggregate of commodities, material and immaterial, including services of all kinds. This is the true net annual income or revenue of the country or national dividend.

Pigovian Definition:- According to Pigou "National income is that part of objective income of the community, including of course income derived from abroad which can be measured in money"

Fisher's Definition:- Fisher adopted consumption as the criterion of national certain whereas Marshall and Pigou regarded it to be production.

According to Fisher 'The national income consists solely of services as received by ultimate consumers whether from their material or from their human environment'.

From the modern point of view national income is defined as the net output of commodities and services flowing during the year from country's productive system in the hands of ultimate consumer.

CIRCULAR FLOW OF INCOME

The total income obtained as wages, rent, interest and profits are the national income of the country. Various households get their income from the firms for the production of goods and services. The value of all the goods produced is the national product. Thus the total national product produced by firms in a year is distributed to all factors in the form of wages, interest rent and profits. The sum of all these factors income will be equal to the national income. Thus the national product is equal to the national income.

National Income = Wages + Rent + Interest + profit

National income = Domestic income + Net income from abroad.

Personal Income = Domestic income + Net income from abroad + Transfer Payments + Net interest on borrowings + Unearned income - Taxes on profit - Undistributed profit - Contribution to social security measures.

METHODS OF MEASUREMENT OF NATIONAL INCOME

There are three methods to calculate the national income of a country. They are:

1. Product or inventory method: Under this method national income is computed by adding the net value of all commodities and services produced during a given period. Thus national income is equal to the total of final products. We first estimate the gross value of domestic output in the various sectors of production (Agriculture, manufacturing industry, and services including government). The value of gross output is obtained by multiplying the output of each sector by their respective market prices and adding them together. Then we deduct value of depreciation from gross value of domestic output. The figure so obtained has to be adjusted with net income from abroad. This is the national income at factor cost. This method is also known as output method or value added method. This method is very complicated because of non-availability of adequate and requisite data. It is also difficult to calculate depreciation.

2. **Income Method:** Under this method the national income of a country is obtained by adding the incomes accrue to factors of production within the national territory. Basic factors of production used producing the national products are land, labour, capital and organisation. The national income is equal to total rent plus total wages and salaries of all employees including income of self employed persons plus total interest on capital including dividends of the shareholders plus total profit of all firms including undistributed corporate profits and earnings of public enterprises. In short, the national income represents the total of rent, wages, interest and profit.

It is difficult to make distinction between the earnings from ordinary labour and organisational efforts. It is also difficult to make distinction between earnings from land and capital. Therefore factors of production are grouped as labour and capital for purposes of estimating national income. Under this method, the income earned by all individuals of the country during a year is taken. Individuals earn income in the form of Rent, profit, wages, and salaries and interest. This method is called income method.

3. Expenditure method: This method is based on the assumption that income is equal to expenditure plus savings. Under this method the personal consumption expenditure, government purchase of goods and services, gross private domestic investment and net foreign investment are added together to get the national income of a country. This method is also known as consumption- saving method.

The expenditure method is not generally used because the necessary data regarding consumption expenditure are not easily available. This method includes the total expenditure of a country during a given year. The income is spent on consumer goods or on producer goods. The consumption expenditure and investment expenditure of all the individuals in a government during a year is added. Thus

National Income = Consumption Expenditure + Investment Expenditure + government

expenditure + exports - imports.

Y = C + I + G + X-M

4.Value Added Method

Another method of measuring national income is the value added by industries. The difference between the value of material output and input at each stage of production is the value added. If all such differences are added up for all industries in the economy we arrive at the gross domestic product.

CONCEPTS OF NATIONAL INCOME

There are various concepts of national income

1.Gross National Product (GNP)

Gross national product is defined as the total market value of all final goods and services produced in a year. GNP includes four types of final goods and services, (i) Consumer goods and services to satisfy the immediate wants of the people (ii) gross private domestic investment on capital goods consisting of fixed capital formation, residential constructions and inventories of finished and unfinished goods, (iii) goods and services produced by government and (ir) net export of goods and services'

GNP = government production + private output

2.Net National Product (NNP)

The second concept is Net National Product. The capital goods like machinery wear out as a result of continuous use. This is called depreciation. This is also called National income at market prices. Hence NNP = GNP - depreciation.

3.National Income at factor cost

National income at factor cost denotes the sum of all incomes earner by the factors. GNP at factor cost is the sum of the money value of the income produced by and accruing to the various factors of production in one year in a country.

It includes all items of GNP less indirect tax. GNP at market price is always more

than GNP at factor cost as GNP at factor cost is the income which the factors of production receive in return for their service alone. National income at factor cost = net national product - indirect taxes + subsidies.

4. Personal Income (PI)

Personal income is the sum of all incomes received by all individuals during a given year. Some incomes such as Social security contribution are not received by individuals, similarly some incomes such as transfer payments are not currently earned, for example Old Age Pension. Therefore,

Personal income = national income - social security contribution - Corporate income taxes - undistributed corporate profit + transfer payment.

5.Disposable Income (DI)

Disposable income = personal income - personal taxes

After a part of the income is paid to the Government in the form of taxes, the remaining income is called disposable income.

DIFFICULTIES IN THE MEASUREMENT OF NATIONAL INCOME

There are certain difficulties in the measurement of National Income. They are given below:

1. The National Income must be calculated in monetary terms. There are certain nonmonetary transactions which are not included in the value of product. For example the unpaid personal services of a housewife cannot be included in the national product.

2. The Government services such as justice .administration and defence should be treated as equivalent to any other capital formation.

3.The treatment of profits of foreign firms as income of the parent country is another difficulty in measurement, because the foreign firms production is taking place in India while the profits of the firm is not considered in the income calculation of the country.

4. In underdeveloped countries like India, the major part of the output does not come to the

market due to non monetized transaction. This results in the underestimation of the National Income.

5. Due to illiteracy regular accounts are not kept by the producers. This also makes the national income calculation more difficult.

6. The agriculture and industrial sectors are unorganized and scattered in India.

7. Finally the lack of statistical data and unreliability of statistics is the major difficulties in measuring the National Income.

8. A Greatest difficulty in calculating the national income is of double counting which arises from the failure, to distinguish properly, between a final and intermediate product.

9. Income earned through illegal activities such as gambling or illicit extraction of wine etc is not included in national income. Such goods and services do have value and meet the needs of consumers. But by leaving them out, national income works out to less than actual.

10. There arises difficulty of including transfer payments in the national income. Individuals get pension, unemployment allowance and interest on public loan's but whether these should be included on the national income in a difficult problem.

11. Another difficulty in calculating national income is that of price changes which fail to keep stable the measuring rod of money for national income. When the price level in the country rises the national income also shows an increase even though production might have fallen. Thus the above difficulties involved in National Income analysis are both statistical and conceptual. Therefore the National Income cannot be calculated accurately.

SIGNIFICANCE OR IMPORTANCE OF NATIONAL INCOME ESTIMATES

The following are the main uses of national income analysis:

1 The national income estimate reveals the overall production performance of the

economy. It records the level of production in each year. This enables to compare the real growth of the economy over the years.

2. The percapita income measures the average standard of living of the people. It is used to compare standards of living in different countries.

3. National income data are used to measure economic welfare of the community. Other things being equal, economic welfare is greater if rational income is higher and vice versa.

4. The study of national income statistics is useful in diagnosing the economic ills of a country and suggesting remedies.

5. The national income figures are useful in assessing the pace of economic development of a country.

6. The national income figures are used to assess the savings and investment potential of the community. The rate of saving and investment depend on national income.

7. The comparison of rational income over the years enables to know the nature of the economy. This is important when the government of a country launches planning for economic development. In factor planning is possible without national income estimates.

8. National income estimates show the contribution made by different sectors of the economy such as agriculture, industry, trade and commerce, service etc. On the basis of

national income figures.

9. National income estimates will tell us how far different categories of income such as rent,

wages, interest, and profits are contributing to national income.

1O. The formulation of panning for different sectors of the economy is based on the national

income figures. National income estimates are very useful in formulating plans for the development of agriculture, industry, infrastructure etc.

11. We can evaluate the achievements of the development targets laid down in the plus from the

changes in national income and various components.

12. National income data are useful for forecasting future economic events.

13. National income statistics can be used to determine how an international financial burden

should be apportioned between different countries.

14. In war time the study of the components of national income is of great importance because

they show the maximum production possibilities of the country.

LIMITATIONS OF NATIONAL INCOME ESTIMATES

Undoubtedly, the national income data are highly useful for several purposes. But we should take much care while using the national income figures. They cannot be taken as absolutely reliable. They suffer from the following limitations.

1.Comparisons of income are valid only for short period, say, four or five years. But over longer periods they may be misleading. Over a longer period, a number of new products may appear in the economy and a number of old products may disappear from the consumption. Hence the real income will change and the comparison will not have much meaning.

2.It is difficult to compare the incomes of two countries of different economic systems.

3.In underdeveloped countries, most production takes place in the hones of the people. But

national income estimates are limited to goods and services sold in the market. Thus, statistics would omit the largest part of the real incomes of underdeveloped countries.

4.The rational income figures measure money incomes rather than real incomes. There are some difficulties in the ascertainment of real income.

5.They are only rough approximations. On their basis we cannot say that a certain policy will produce the desired result.

National income is the final outcome of all economic activities of a nation valued in terms of money. National income is the most important macroeconomic variable determinant of the business level and environment of a country.

The level of national income determines the level of aggregate demand for goods and services. Its distribution pattern determines the pattern of demand for goods and services, i.e., how much of which good is demanded. The trend in national income determines the trends in aggregate demand, i.e., the demand for the goods and services, and also the business prospects.

Therefore, business decision makers need to keep in mind these aspects of the national income, especially those having long-run implications. National income or relevant component of it is an indispensable variable considered in demand forecasting.

Conceptually, national income is the money value of the end result of all economic activities of the nation. Economic activities generate a large number of goods and services, and make net addition to the national stock of capital. These together constitute the national income of a 'closed economy'—an economy which has no economic transactions with the rest of the world. In an 'open economy', national income includes also the net results of its transactions with the rest of the world (i.e., exports less imports).

Economic activities should be distinguished from the non-economic activities from a national point of view. Broadly speaking, economic activities include all human activities which create goods and services that can be valued at market price. Economic activities include production by farmers (whether for household consumption or for market), production by firms

in the industrial sector, production of goods and services by the government enterprises, and services produced by business intermediaries (wholesalers and retailers), banks and other financial organizations, universities, colleges and hospitals, etc.

On the other hand, non-economic activities are those which produce goods and services that do not have any economic value. Non-economic activities include spiritual, psychological, social and political services. The non-economic category of activities also includes hobbies, service to self, services of housewives, services of members of family to other members and exchange of mutual services between neighbors.

We have defined national income from the angle of product flows. The same can be defined in terms of money flows. While economic activities generate flow of goods and services, on the one hand, they generate money flows, on the other, in the form of factor payments—wages, interest, rent, profits, and earnings of self-employed. Thus, national income may also be obtained by adding the factor earnings and adjusting the sum for indirect taxes and subsidies. The national income thus obtained is known as national income at factor cost. It is related to money income flows. The concept of national income is linked to the society as a whole.

It differs fundamentally from the concept of private income. Conceptually, national income refers to the money value of the entire final goods and services resulting from all economic activities of the country. This is not true of private income. Also from the calculation point of view, there are certain receipts of money or of services and goods that are not ordinarily included in private incomes but are included in the national incomes, and vice versa.

National income includes, for example, employer's contribution to the social security and welfare funds for the benefit of employees, profits of public enterprises, and services of owner occupied houses. But it excludes the interest on war-loans, social security benefits and pensions. There items are, however, included in the private incomes. The national income is, therefore, not merely an aggregation of the private incomes. One can however obtain an estimate

of national income by summing up the private incomes after making necessary adjustments for the items excluded from the national income.

MEASURES OF NATIONAL INCOME

Gross National Product (GNP)

Of the various measures of national income used in national income analysis, GNP is the most important and widely used measure of national income. It is the most comprehensive measure of the nation's productive activities. The GNP is defined as the value of all final goods and services produced during a specific period, usually one year, plus incomes earned abroad by the nationals minus incomes earned locally by the foreigners. The GNP so defined is identical to the concept of gross national income (GNI). Thus, GNP = GNI. The difference between the two is only of procedural nature. While GNP is estimated on the basis of product-flows, the GNI is estimated on the basis of money income flows, (i.e., wages, profits, rent, interest, etc.).

Gross Domestic Product (GDP)

The Gross Domestic Product (GDP) is defined as the market value of all final goods and services produced in the domestic economy during a period of one year, plus income earned locally by the foreigners minus incomes earned abroad by the nationals. The concept of GDP is similar to that of GNP with a significant procedural difference. In case of GNP the incomes earned by the nationals in foreign countries are added and incomes earned locally by the foreigners are deducted from the market value of domestically produced goods and services. In case of GDP, the process is reverse – incomes earned locally by foreigners are added and incomes earned abroad by the nationals are deducted from the total value of domestically produced goods and services.

Net National Product (NNP)

NNP is defined as GNP less depreciation, i.e., NNP = GNP – Depreciation is that part of total productive assets which is used to replace the capital worn out in the process of creating GNP. Briefly speaking, in the process of producing goods and services (including capital goods), a part of total stock of capital is used up. 'Depreciation' is the term used to denote the worn out or used up capital. An estimated value of depreciation is deducted from the GNP to arrive at

NNP. The NNP, as defined above, gives the measure of net output available for consumption and investment by the society (including consumers, producers and the government).

NNP is the real measure of the national income. NNP = NNI (net national income). In other words, NNP is the same as the national income at factor cost. It should be noted that NNP is measured at market prices including direct taxes. Indirect taxes are, however, not a point of actual cost of production. Therefore, to obtain real national income, indirect taxes are deducted from the NNP. Thus, NNP–indirect taxes = National Income.

National Income: Some Accounting Relationships

(a) Accounting Identities at Market Price

GNP ≡ GNI (Gross National Income)

GDP ≡ GNP less Net Income from Abroad

NNP ≡ GNP less Depreciation

NDP (Net Domestic Product) ≡ NNP less net income from abroad

(b) Some Accounting Identities at Factor Cost

GNP at factor cost ≡ GNP at market price less net indirect taxes

NNP at factor cost ≡ NNP at market price less net indirect taxes

NDP at factor cost ≡ NNP at market price less net income from abroad

NDP at factor cost ≡ NDP at market price less net indirect taxes

NDP at factor cost ≡ GDP at market price less Depreciation

METHODS OF MEASURING NATIONAL INCOME

For measuring national income, the economy through which people participate in economic activities, earn their livelihood, produce goods and services and share the national products is viewed from three different angles.

(1) The national economy is considered as an aggregate of producing units combining different sectors such as agriculture, mining, manufacturing, trade and commerce, etc.

(2) The whole national economy is viewed as a combination of individuals and households owning different kinds of factors of production which they use themselves or sell factor-services to make their livelihood.

(3) The national economy may also be viewed as a collection of consuming, saving and investing units (individuals, households and government).

Following these notions of a national economy, national income may be measured by three different corresponding methods:

(1) Net product method—when the entire national economy is considered as an aggregate of producing units;

(2) Factor-income method—when national economy is considered as combination of factor-owners and users;

(3) Expenditure method—when national economy is viewed as a collection of spending units.

Net Output or Value-Added Method

The net output method is also called the value added method. In its standard form, this method consists of three stages: "(i) estimating the gross value of domestic output in the various branches of production; (ii) determining the cost of material and services used and also the depreciation of physical assets; and (iii) deducting these costs and depreciation from gross value to obtain the net value of domestic output…" The net value of domestic product thus obtained is often called the value added or income product which is equal to the sum of wages, salaries, supplementary labor incomes, interest, profits, and net rent paid or accrued. Let us now describe the stages (i) and (ii) in some detail.

Measuring Gross Value.

For measuring the gross value of domestic product, output is classified under various categories on the basis of the nature of activities from which they originate. The output classification varies from country to country depending on (i) the nature of domestic activities; (ii) their significance in aggregate economic activities, and (iii) availability of requisite data. For example, in the US, about seventy-one divisions and subdivisions are used to classify the national output; in Canada and the Netherlands, classification ranges from a dozen to a score; and in Russia, only half a dozen divisions are used. According to the CSO publication, fifteen sub-categories are currently used in India.

After the output is classified under the various categories, the value of gross output is computed in two alternative ways: (i) by multiplying the output of each category of sector by their respective market price and adding them together, or (ii) by collective data about the gross sales and changes in inventories from the account of the manufacturing enterprises and computing the value of GDP on the basis thereof. If there are gaps in data, some estimates are made thereof and gaps are filled.

Estimating Cost of Production.

The next step in estimating the net national product is to estimate the cost of production including depreciation. Estimating cost of production is, however, a relatively more complicated and difficult task because of no availability of adequate and requisite data. Much more difficult is the task of estimating depreciation since it involves both conceptual and statistical problems. For this reason, many countries adopt factor-income method for estimating their national income.

However, countries adopting net-product method find some ways and means to calculate the deductible cost. The costs are estimated either in absolute terms (where input data are adequately available) or as an overall ratio of input to the total output.

The general practice in estimating depreciation is to follow the usual business practice of depreciation accounting. Traditionally, depreciation is calculated at some percentage of capital, permissible under the tax-laws. In some estimates of national income, the estimators have deviated from the traditional practice and have instead estimated depreciation as some ratio of the current output of final goods.

Following a suitable method, deductible costs including depreciation are estimated for each sector. The cost estimates are then deducted from the sectoral gross output to obtain the net sectoral products. The net sectoral products are then added together. The total thus obtained is taken to be the measure of net national products or national income by net product method.

Factor-Income Method

This method is also known as income method and factor-share method. Under this method, the national income is calculated by adding up all the "incomes accruing to the basic

factors of production used in producing the national product". Factors of production are conventionally classified as land, labor, capital and organization. Accordingly, the national income equals the sum of the corresponding factor earning.

Thus, National income = Rent + Wages + Interest + Profit However, in a modern economy, it is conceptually very difficult to make a distinction between earnings from land and capital, on the one hand, and between the earnings from ordinary labor and entrepreneurial functions, on the other. For the purpose of estimating national income, therefore, factors of production are broadly grouped as labor and capital. Accordingly, national income is supposed to originate from two primary factors, viz., labor and capital.

In some activities, however, labor and capital are jointly supplied and it is difficult to separate the labor and capital contents from the total earnings of the supplier. Such incomes are termed as mixed incomes. Thus, the total factor-incomes are grouped under three categories:
(i) labor incomes; (ii) capital incomes; and (iii) mixed incomes.

1) Labor Incomes.

Labor incomes included in the national income have three components: (a) wages and salaries paid to the residents of the country including bonus and commission, and social security payments; (b) supplementary labor incomes including employer's contribution to social security and employee's welfare funds, and direct pension payments to retired employees2;
(c) supplementary labor incomes in kind, e.g., free health and education, food and clothing, and accommodation, etc. Compensations in kind in the form of domestic servants and such other free-of-cost services provided to the employees are included in labor income. War bonuses, pensions, service grants are not included in labor income as they are regarded as 'transfer payments'. Certain other categories of income, e.g., incomes from incidental jobs, gratuities, tips etc., are ignored for lack of data.

2) Capital Incomes.

According to Studenski, capital incomes include the following capital earnings:
(a) Dividends excluding inter-corporate dividends;
(b) Undistributed before-tax profits of corporations;

(c) Interest on bonds, mortgages, and saving deposits (excluding interests on war bonds and on consumer-credit);

(d) Interest earned by insurance companies and credited to the insurance policy reserves;

(e) Net interest paid out by commercial banks;

(f) Net rents from land, buildings, etc., including imputed net rents on owner-occupied dwellings;

(g) Royalties; and

(h) Profits of government enterprises.

The data for the first two items are obtained mostly from the firms' accounts submitted for taxation purposes. But the definition of profit for national accounting purposes differs from that employed by taxation authorities. Some adjustments in the income tax data become, therefore, necessary. The data adjustments generally pertain to (i) excessive allowance of depreciation made by the firms; (ii) elimination of capital gains and losses since these do not reflect the changes in current income; and (iii) elimination of under or over-valuation of inventories on book-value.

3) Mixed Income.

Mixed incomes include earnings from (a) farming enterprises, (b) sole proprietorship (not included under profit or capital income); and (c) other professions, e.g., legal and medical practices, consultancy services, trading and transporting etc. This category also includes the incomes of those who earn their living through various sources as wages, rent on own property, interest on own capital, etc. All the three kinds of incomes, viz., labor incomes, capital incomes and mixed incomes added together give the measure of national income by factor-income method.

Expenditure Method

The expenditure method, also known as final product method, measures national income at the final expenditure stages. In estimating the total national expenditure, any of the two following methods are followed: first, all the money expenditures at market price are

computed and added up together, and second, the value of all the products finally disposed of are computed and added up, to arrive at the total national expenditure. The items of expenditure which are taken into account under the first method are (a) private consumption expenditure; (b) direct tax payments; (c) payments to the non-profit making institutions and charitable organizations like schools, hospitals, orphanages, etc.; and (d) private savings. Under the second method, the following items are considered: (a) private consumer goods and services; (b) private investment goods; (c) public goods and services; and (d) net investment abroad. The second method is more extensively used because the data required in this method can be collected with greater ease and accuracy.

Treatment of Net Income from Abroad.

We have so far discussed methods of measuring national income of a 'closed economy'. But most economies are open in the sense that they carry out foreign trade in goods and services and financial transactions with the rest of the world. In the process, some nations get net income through foreign trade while some lose their income to foreigners.

The net earnings or loss in foreign trade affects the national income. In measuring the national income, therefore, the net result of external transactions is adjusted to the total. Net incomes from abroad are added to, and net losses to the foreigners are deducted from the total national income arrived at through any of the above three methods.

Briefly, speaking, all exports of merchandise and of services like shipping, insurance, banking, tourism, and gifts are added to the national income. And, all the imports of the corresponding items are deducted from the value of national output to arrive at the approximate measure of national income. To this is added the net income from foreign investment. These adjustments for international transactions are based on the international balance of payments of the nations.

Importance of National Income Computation

The computation of national income is one of the very important statistics for a country. IT has several important uses and therefore there is a great need for their regular preparation. The following are some of the important uses of national income statistics:

Level of Economic Welfare

The national income estimate reveals the overall performance of the country during a given financial year. With the help of this statistics the per capita income i.e. the income earned by every individual is calculated. It is obtained by dividing the total national income by the total population. With this we come to the level of economic welfare in terms of its standard of living.

Rate of Economic Growth

With the help of national income statistics we can know weather the economy is growing or declining. In simple words it helps us to know the conditions of a country economy. If the national income is growing over a period of year it means that the economy is growing and if the national income has reduced as compares to the previous it reveals that the economy is detraining. Similarly the growing per capita income shows an increasing standard o living of the people which are a positive sign of a nation's growth and vice versa.

Distribution of Wealth

One of the most important objectives that are achieved after calculating national income is to check its distribution among different categories of income such as wages, profits, rents and interest. It helps to understand that how well the income is distributed among the various factors of the economy and their distribution among the people as well.

Ease in Planning

Since the national income estimates also contain the figures of saving, consumption and investment in the economy so it proves to be a valuable guide to economic policy relating to planning and active government intervention in the economy. The estimates are used as a data for future planning also.

Formation of Budget

Budget is an effective tool for planning and control. It is prepared in the light of the information regarding consumption, saving, and investment which is all provided by the national income estimates. Further we can asses and evaluate the achievements or otherwise of the development targets laid down in the plans from the changes in national income and its various components.

THEORIES OF INCOME, OUTPUT AND EMPLOYMENT

The Keynesian Theory

Keynes's theory of the determination of equilibrium real GDP, employment, and prices focuses on the relationship between aggregate income and expenditure. Keynes used his income -expenditure model to argue that the economy's equilibrium level of output real GDP may not correspond to the natural level of real GDP. In the income - expenditure model, the equilibrium level of real GDP is the level of real GDP that is consistent with the current level of aggregate expenditure. If the current level of aggregate expenditure is not sufficient to purchase all of the real GDP supplied, output will be cut back until the level of real GDP is equal to the level of aggregate expenditure.

Hence, if the current level of aggregate expenditure is not sufficient to purchase the natural level of real GDP, then the equilibrium level of real GDP will lie somewhere below the natural level. In this situation, the classical theorists believe that prices and wages will fall, reducing producer costs and increasing the supply of real GDP until it is again equal to the natural level of real GDP.

Sticky prices. Keynesians, however, believe that prices and wages are not so flexible. They believe that prices and wages are sticky, especially downward. The stickiness of prices and wages in the downward direction prevents the economy's resources from being fully employed and thereby prevents the economy from returning to the natural level of real GDP. Thus, the Keynesian theory is a rejection of Say's Law and the notion that the economy is self-regulating.

Keynes's income expenditure model. Recall that real GDP can be decomposed into four component parts: aggregate expenditures on consumption, investment, government, and net exports. The income expenditure model considers the relationship between these expenditures and current real national income. Aggregate expenditures on investment, I, government, G, and net exports, NX, are typically regarded as autonomous or independent of current income.

The exception is aggregate expenditures on consumption. Keynes argues that aggregate consumption expenditures are determined primarily by current real national income. He suggests that aggregate consumption expenditures can be summarized by the equation

$$\text{aggregate consumption} = C + mpc(Y)$$

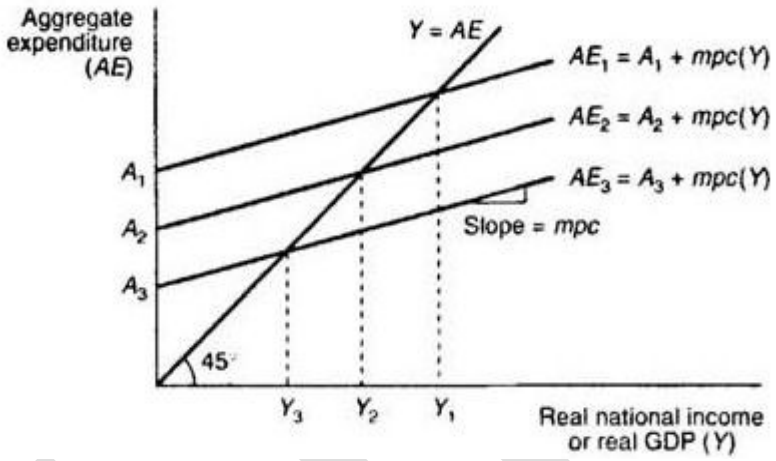
Where C denotes autonomous consumption expenditure and Y is the level of current real income, which is equivalent to the value of current real GDP. The marginal propensity to consume (mpc), which multiplies Y, is the fraction of a change in real income that is currently consumed. In most economies, the mpc is quite high, ranging anywhere from .60 to .95. Note that as the level of Y increases, so too does the level of aggregate consumption.

Total aggregate expenditure, AE, can be written as the equation

$$AE = A + mpc(Y)$$

Where A denotes total autonomous expenditure or the sum C + I + G + NX. Different levels of autonomous expenditure, A, and real national income, Y, correspond to different levels of aggregate expenditure, AE.

Equilibrium real GDP in the income-expenditure model is found by setting current real national income, Y, equal to current aggregate expenditure, AE. Algebraically, the equilibrium conditions that Y = AE implies that



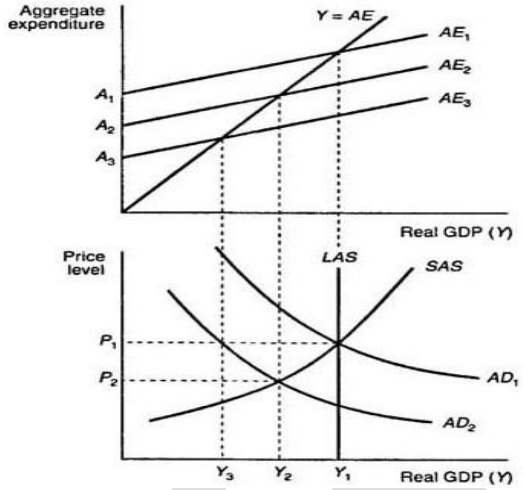
In words, the equilibrium level of real GDP, Y*, is equal to the level of autonomous expenditure, A, multiplied by m, the Keynesian multiplier. Because the mpc is the fraction of a change in real national income that is consumed, it always takes on values between 0 and 1. Consequently, the Keynesian multiplier, m, is always greater than 1, implying that equilibrium real GDP, Y*, is always a multiple of autonomous aggregate expenditure, A, which explains why m is referred to as the Keynesian multiplier.

The determination of equilibrium real national income or GDP using the income-expenditure approach can be depicted graphically, as in Figure. This figure shows three different aggregate expenditure curves, labeled AE 1, AE 2, and A 3, which correspond to three different levels of autonomous expenditure, A 1, A 2, and A 3. The upward slope of these AE curves is due to the positive value of the mpc. As real national income Y rises, so does the level of aggregate expenditure. The Keynesian condition for the determination of equilibrium real GDP is that Y = AE. This equilibrium condition is denoted in Figure by the diagonal, 45° line, labeled Y = AE.

To find the level of equilibrium real national income or GDP, you simply find the intersection of the AE curve with the 45° line. The levels of real GDP that correspond to

these intersection points are the equilibrium levels of real GDP, denoted in Figure as Y 1, Y 2, and Y 3. Note that each AE curve corresponds to a different equilibrium level for Y.

Note also that each Y is a multiple of the level of autonomous aggregate expenditure, A, as was found in the algebraic determination of the level of equilibrium real GDP. Graphical illustration of the Keynesian theory. The Keynesian theory of the determination of equilibrium output and prices makes use of both the income-expenditure model and the aggregate demand-aggregate supply model, as shown in Figure.



Suppose that the economy is initially at the natural level of real GDP that corresponds to Y 1 in Figure. Associated with this level of real GDP is an aggregate expenditure curve, AE 1. Now, suppose that autonomous expenditure declines, from A 1 to A 3, causing the AE curve to shift downward from AE 1 to AE 3. This decline in autonomous expenditure is also represented by a reduction in aggregate demand from AD 1 to AD 2. At the same price level, P 1, equilibrium real GDP has fallen from Y 1 to Y 3. However, the intersection of the SAS and AD 2 curves is at the lower price level, P 2, implying that the price level falls. The fall in the price level means that the aggregate expenditure curve will not fall all the way to AE 3 but will instead fall only to AE 2. Therefore, the new level of equilibrium real GDP is at Y 2, which lies below the natural level, Y 1.

Keynes argues that prices will not fall further below P 2 because workers and other resources will resist any reduction in their wages, and this resistance will prevent suppliers from increasing their supplies. Hence, the SAS curve will not shift to the right as in the classical theory and the economy will remain at Y 2, where some of the economy's workers and resources are unemployed. Because these unemployed workers and resources earn no income, they cannot purchase goods and services. Consequently, the aggregate expenditure curve remains stuck at AE 2, preventing the economy from achieving the natural level of real GDP. Figure therefore illustrates the Keynesians' rejection of Say's Law, price level flexibility, and the notion of a self-regulating economy.

The Classical Theory

The fundamental principle of the classical theory is that the economy is self-regulating. Classical economists maintain that the economy is always capable of achieving the natural level of real GDP or output, which is the level of real GDP that is obtained when the economy's resources are fully employed. While circumstances arise from time to time that cause the economy to fall below or to exceed the natural level of real GDP, self-adjustment mechanisms exist within the market system that work to bring the economy back to the natural level of real GDP. The classical doctrine—that the economy is always at or near the natural level of real GDP—is based on two firmly held beliefs: Say's Law and the belief that prices, wages, and interest rates are flexible.

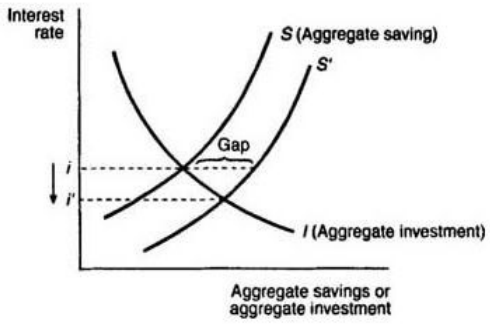
Say's Law. According to Say's Law, when an economy produces a certain level of real GDP, it also generates the income needed to purchase that level of real GDP. In other words, the economy is always capable of demanding all of the output that its workers and firms choose to produce. Hence, the economy is always capable of achieving the natural level of real GDP.

The achievement of the natural level of real GDP is not as simple as Say's Law would seem to suggest. While it is true that the income obtained from producing a certain level of real

GDP must be sufficient to purchase that level of real GDP, there is no guarantee that all of this income will be spent. Some of this income will be saved. Income that is saved is not used to purchase consumption goods and services, implying that the demand for these goods and services will be less than the supply. If aggregate demand falls below aggregate supply due to aggregate saving, suppliers will cut back on their production and reduce the number of resources that they employ.

When employment of the economy's resources falls below the full employment level, the equilibrium level of real GDP also falls below its natural level. Consequently, the economy may not achieve the natural level of real GDP if there is aggregate saving. The classical theorists' response is that the funds from aggregate saving are eventually borrowed and turned into investment expenditures, which are a component of real GDP. Hence, aggregate saving need not lead to a reduction in real GDP.

Consider, however, what happens when the funds from aggregate saving exceed the needs of all borrowers in the economy. In this situation, real GDP will fall below its natural level because investment expenditures will be less than the level of aggregate saving. This situation is illustrated in figure.



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Aggregate saving, represented by the curve S, is an upward-sloping function of the interest rate; as the interest rate rises, the economy tends to save more. Aggregate investment, represented by the curve I, is a downward-sloping function of the interest rate; as the interest rate rises, the cost of borrowing increases and investment expenditures decline. Initially, aggregate saving and investment are equivalent at the interest rate, i. If aggregate saving were to increase,

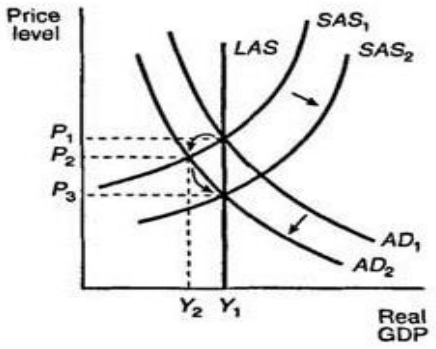
causing the S curve to shift to the right to S′, then at the same interest rate i, a gap emerges between investment and savings. Aggregate investment will be lower than aggregate saving, implying that equilibrium real GDP will be below its natural level.

Flexible interest rates, wages, and prices. Classical economists believe that under these circumstances, the interest rate will fall, causing investors to demand more of the available savings. In fact, the interest rate will fall far enough—from i toi′ in Figure —to make the supply of funds from aggregate saving equal to the demand for funds by all investors. Hence, an increase in savings will lead to an increase in investment expenditures through a reduction of the interest rate, and the economy will always return to the natural level of real GDP. The flexibility of the interest rate as well as other prices is the self-adjusting mechanism of the classical theory that ensures that real GDP is always at its natural level. The flexibility of the interest rate keeps the money market, or the market for loan able funds, in equilibrium all the time and thus prevents real GDP from falling below its natural level.

Similarly, flexibility of the wage rate keeps the labor market or the market for workers, in equilibrium all the time. If the supply of workers exceeds firms' demand for workers, then wages paid to workers will fall so as to ensure that the work force is fully employed. Classical economists believe that any unemployment that occurs in the labor market or in other resource markets should be considered voluntary unemployment.

Voluntarily unemployed workers are unemployed because they refuse to accept lower wages. If they would only accept lower wages, firms would be eager to employ them.

Graphical illustration of the classical theory as it relates to a decrease in aggregate demand. Figure considers a decrease in aggregate demand from AD 1to AD 2.



The immediate, short-run effect is that the economy moves down along the SAS curve labeled SAS 1, causing the equilibrium price level to fall from P 1 to P 2, and equilibrium real GDP to fall below its natural level of Y 1 to Y 2. If real GDP falls below its natural level, the economy's workers and resources are not being fully employed. When there are unemployed resources, the classical theory predicts that the wages paid to these resources will fall. With the fall in wages, suppliers will be able to supply more goods at lower cost, causing the SAS curve to shift to the right from SAS 1 to SAS 2. The end result is that the equilibrium price level falls to P 3, but the economy returns to the natural level of real GDP.

INFLATION:

Inflation is a sustained increase in the cost of living or the average / general price level leading to a fall in the purchasing power of money. The opposite of inflation is deflation which is a decrease in the cost of living or average price level.

How is the rate of inflation measured?

The rate of inflation is measured by the annual percentage change in consumer prices. The British government has set an inflation target of 2% using the consumer price index(CPI) It

is the job of the Bank of England to set interest rates so that aggregate demand is controlled, inflationary pressures are subdued and the inflation target is reached. The Bank is independent of the government with control of interest rates and it is free from political intervention. The Bank is also concerned to avoid price deflation – we return to this a little later.

Falling inflation does not mean falling prices

Please remember that a fall in the rate of inflation is not the same thing as a fall in prices! Have a look at the chart above which measures the rate of consumer price inflation for the UK. Notice how in 2009 there was a steep drop in inflation from 5 per cent to 1 per cent over the course of the year. Inflation was falling – but the rate remained positive – meaning that prices were rising but at a slower rate! A slowdown in inflation is not the same as deflation! For this to happen, inflation would have to be negative.
How is the rate of inflation calculated?

The cost of living is a measure of changes in the average cost of buying a basket of different goods and services for a typical household. In the UK there are two measures, the Retail Price Index (RPI) & the Consumer Price Index (CPI). The major difference between the two measures, is that CPI calculations excludes payments on mortgage interest - it is thought that by excluding mortgages, the CPI is a better measure of the impact of macroeconomic policy

The CPI is a weighted price index. Changes in weights reflect shifts in the spending patterns of households in the British economy as measured by the Family Expenditure Survey.

Calculating a weighted price index

The following hypothetical example shows how to calculate a weighted price index.

Category	Price Index	Weighting	Price X Weight
Food	104	19	1976
Alcohol & Tobacco	110	5	550
Clothing	96	12	1152
Transport	108	14	1512
Housing	106	23	2438
Leisure Services	102	9	918

Household Goods	95	10	950
Other Items	114	8	912
		100	10408

The price index for this year is: the sum of (price x weight) / sum of the weights. So the price index for this year is 104.1 (rounding to one decimal place). The rate of inflation is the % change in the price index from one year to another. So if in one year the price index is 104.1 and a year later the price index has risen to 112.5, then the annual rate of inflation = (112.5 – 104.1) divided by 104.1 x 100. Thus the rate of inflation = 8.07%.

Limitations of the Consumer Price Index as a measure of inflation

The CPI is not fully representative:

Since the CPI represents the expenditure of the 'average' household, inevitably it will be inaccurate for the 'non-typical' household, for example, 14% of the index is devoted to motoring expenses - inapplicable for non-car owners.

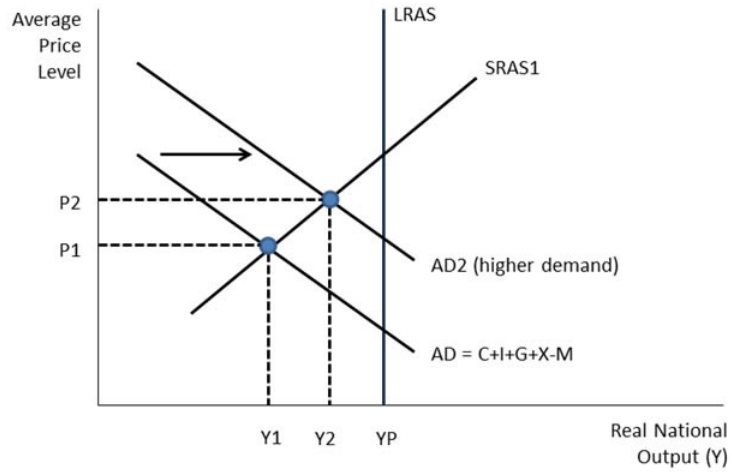
Single people have different spending patterns from households that include children, young from old, male from female, rich from poor and minority groups.

We all have our own 'weighting' for goods and services that does not coincide with that assigned for the consumer price index.

Housing costs: The 'housing' category of the CPI records changes in the costs of rents, property and insurance, repairs. It accounts for around 16% of the index. Housing costs vary greatly from person to person.

Changing quality of goods and services: Although the price of a good or service may rise, this may also be accompanied by an improvement in quality as the product. It is hard to make price comparisons of, for example, electrical goods over the last 20 years because new audio-visual equipment is so different from its predecessors. In this respect, the CPI may over-estimate inflation. The CPI is slow to respond to the emergence of new products and services.

Demand-Pull Inflation



Demand pull inflation occurs when aggregate demand is growing at an unsustainable rate leading to increased pressure on scarce resources and a positive output gap. When there is excess demand, producers are able to raise their prices and achieve bigger profit margins because demand is running ahead of supply. Demand-pull inflation becomes a threat when an economy has experienced a boom with GDP rising faster than the long-run trend growth of potential GDP. Demand-pull inflation is likely when there is full employment of resources and SRAS is inelastic

Main Causes of Demand-Pull Inflation

A depreciation of the exchange rate increases the price of imports and reduces the foreign price of a country's exports. If consumers buy fewer imports, while exports grow, AD in will rise – and there may be a multiplier effect on the level of demand and output. Higher demand from a fiscal stimulus e.g. lower direct or indirect taxes or higher government spending.

If direct taxes are reduced, consumers have more disposable income causing demand to rise. Higher government spending and increased borrowing creates extra demand in the circular flow.

Monetary stimulus to the economy:

A fall in interest rates may stimulate too much demand – for example in raising demand for loans or in leading to house price inflation. Monetarist economists believe that inflation is caused by "too much money chasing too few goods" and that governments can lose control of inflation if they allow the financial system to expand the money supply too quickly.

Fast growth in other countries – providing a boost to UK exports overseas. Export sales provide an extra flow of income and spending into the UK circular flow – so what is happening to the economic cycles of other countries definitely affects the UK

Cost-Push Inflation

Cost-push inflation occurs when firms respond to rising costs, by increasing prices to protect their profit margins.

There are many reasons why costs might rise:

Component costs: e.g. an increase in the prices of raw materials and other components. This might be because of a rise in commodity prices such as oil, copper and agricultural products used in food processing. A recent example has been a surge in the world price of wheat.

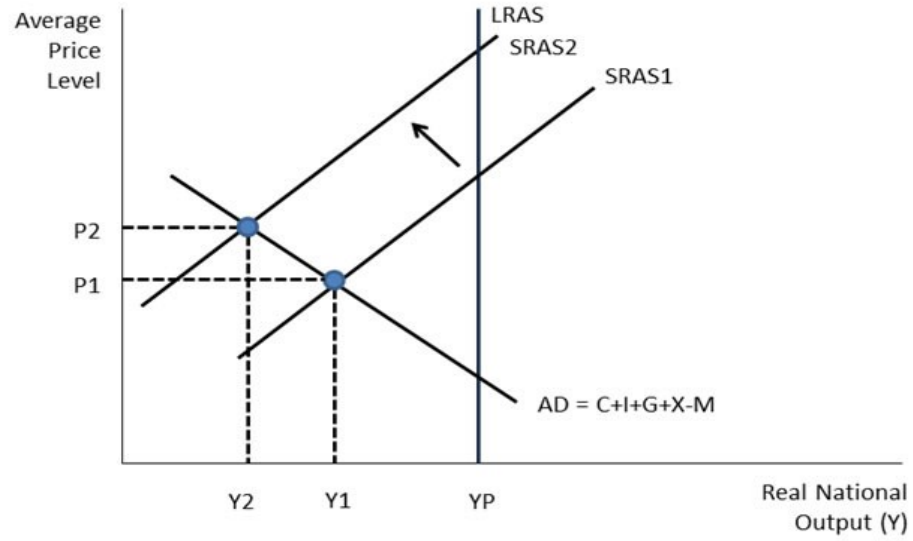
Rising labor costs - caused by wage increases, which are greater than improvements in productivity. Wage costs often rise when unemployment is low because skilled workers become scarce and this can drive pay levels higher. Wages might increase when people expect higher inflation so they ask for more pay in order to protect their real incomes.

Trade unions may use their bargaining power to bid for and achieve increasing wages, this could be a cause of cost-push inflation. Expectations of inflation are important in shaping what actually happens to inflation. When people see prices are rising for everyday items they get concerned about the effects of inflation on their real standard of living. One of the dangers of a pick-up in inflation is what the Bank of England calls "second-round effects" i.e. an initial rise in prices triggers a burst of higher pay claims as workers look to protect their way of life. This is also known as a "wage-price effect".

Higher indirect taxes – for example a rise in the duty on alcohol, fuels and cigarettes, or a rise in Value Added Tax. Depending on the price elasticity of demand and supply for their products, suppliers may choose to pass on the burden of the tax onto consumers.

A fall in the exchange rate – this can cause cost push inflation because it leads to an increase in the prices of imported products such as essential raw materials, components and finished products. Monopoly employers/profit-push inflation – where dominants firms in a market use their market power (at whatever level of demand) to increase prices well above costs

Cost-push inflation such as that caused by a large and persistent rise in the world price of crude oil can be shown in a diagram by an inward shift of the short run aggregate supply curve. The fall in SRAS leads to a contraction of national output together with a rise in the level of prices. This is shown in the next diagram.



Consequences of Inflation:

Many government s have a target for a low but positive rate of inflation. They believe that persistently high inflation can have damaging economic and social consequences.

Income redistribution: One risk of higher inflation is that it has a regressive effect on lower-income families and older people in society. This happen when prices for food and domestic utilities such as water and heating rises at a rapid rate.

Falling real incomes: With millions of people facing a cut in their wages or at best a pay freeze, rising inflation leads to a fall in real incomes.

Negative real interest rates: If interest rates on savings accounts are lower than inflation, people who rely on interest from their savings will be poorer. Real interest rates for millions of savers have been negative for at least four years

Cost of borrowing: High inflation may also lead to higher interest rates for businesses and people needing loans and mortgages as financial markets protect themselves against rising prices and increase the cost of borrowing on short and longer-term debt. There is also pressure on the government to increase the value of the state pension and unemployment benefits and other welfare payments as the cost of living climbs higher.

Risks of wage inflation: High inflation can lead to an increase in pay claims as people look to protect their real incomes. This can lead to a rise in unit labor costs and lower profits for businesses

Business competitiveness: If one country has a much higher rate of inflation than others for a considerable period of time, this will make its exports less price competitive in world markets. Eventually this may show through in reduced export orders, lower profits and fewer jobs, and also in a worsening of a country's trade balance. A fall in exports can trigger negative multiplier and accelerator effects on national income and employment.

Business uncertainty: High and volatile inflation is not good for business confidence partly because they cannot be sure of what their costs and prices are likely to be. This uncertainty might lead to a lower level of capital investment spending.

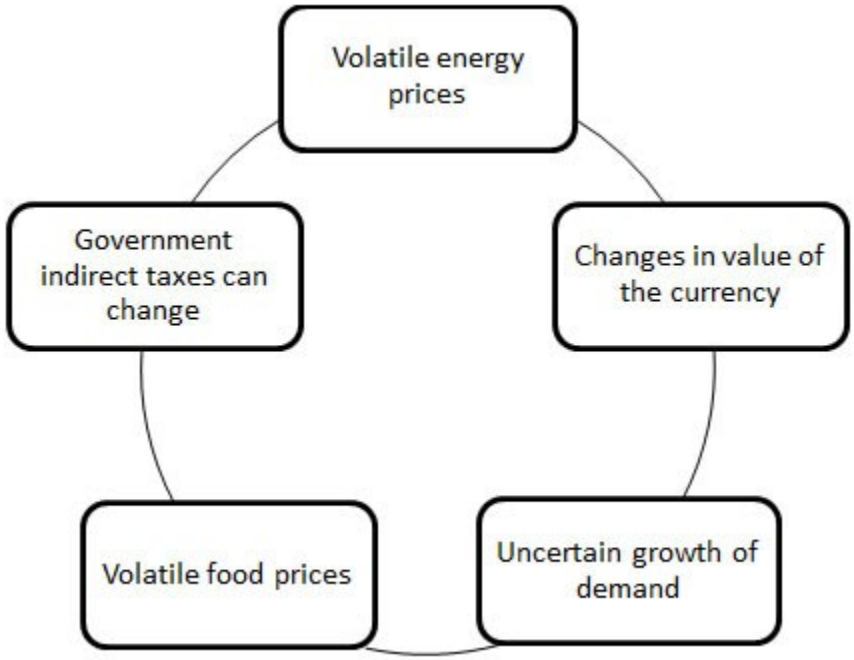
Why is the rate of inflation difficult to forecast accurately?

The rate of inflation is one of the most important macroeconomic indicators that we study in macroeconomics. Data on prices is published regularly and given lots of attention by the media and the financial markets. Many agents be they businesses, households and governments would like to have accurate forecasts of what is likely to happen to prices in the future because they affect spending, saving and investment decisions.

Inflation is a difficult indicator to forecast accurately. Our chart below shows the UK CPI inflation forecast published by the Bank of England in their quarterly Inflation Report. Remember that the Bank of England has a mandate to control the rate of inflation so that CPI inflation remains close to the 2% target.

The probability fan chart for inflation indicates the range of probabilities for inflation in the forecast period. Notice how wide is that range, there is much uncertainty about what is likely to happen to inflation in the UK. In 2014, there is the possibility of deflation (inflation of -1%) or inflation higher than 4%. The darker the shading, the higher the probability attached to the outcome.

Some reasons for difficulties in forecasting inflation



Controlling inflation – macroeconomic policies

Inflation can be reduced by policies that (i) slow down the growth of AD or (ii) boost the rate of growth of aggregate supply (AS)

Fiscal policy:

Controlling aggregate demand is important if inflation is to be controlled. If the government believes that AD is too high, it may choose to 'tighten fiscal policy' by reducing its own spending on public and merit goods or welfare payments

It can choose to raise direct taxes, leading to a reduction in real disposable income

The consequence may be that demand and output are lower which has a negative effect on jobs and real economic growth in the short-term

Monetary policy:

A 'tightening of monetary policy' involves the central bank introducing a period of higher interest rates to reduce consumer and investment spending. Higher interest rates may cause the exchange rate to appreciate in value bringing about a fall in the cost of imported goods and services and also a fall in demand for exports (X)

Supply side economic policies:

Supply side policy seeks to increase productivity, competition and innovation. All of which can maintain lower prices. These are the ways of controlling inflation in the medium term. A reduction in company taxes to encourage greater investment. A reduction in taxes which increases risk-taking and incentives to work – a cut in income taxes can be considered both a fiscal and a supply-side policy. Policies to open a market to more competition to increase supply and lower prices

Rising productivity will cause an outward shift of aggregate supply Direct controls - a government might choose to introduce direct controls on some prices and wages Public sector pay awards – the annual increase in government sector pay might be tightly controlled or even froze (this means a real wage decrease). The prices of some utilities such as water bills are subject to regulatory control – if the price capping regime changes, this can have a short-term effect on the rate of inflation

Controlling Techniques of Inflation

The most appropriate way to control inflation in the short term is for the government and the central bank to keep control of aggregate demand to a level consistent with our

productive capacity. AD is probably better controlled through the use of monetary policy rather than an over-reliance on using fiscal policy as an instrument of demand-management.

Controlling demand to limit inflation is likely to be ineffective in the short run if the main causes are due to external shocks such as high world food and energy prices. The UK is an open economy in which inflation is strongly affected by events in the rest of the world

In the long run, it is the growth of a country's supply side productivity productive potential that gives an economy the flexibility to grow without suffering from acceleration in cost and price

Rising house prices

Rising house prices do not directly cause inflation, but they can cause a positive wealth effect and encourage consumer led economic growth. This can indirectly cause demand pull inflation

Printing more money

If the Central Bank prints more money, you would expect to see a rise in inflation. This is because the money supply plays an important role in determining prices. If there is more money chasing the same amount of goods, then prices will rise. Hyperinflation is usually caused by an extreme increase in the money supply.

However, in exceptional circumstances – such as liquidity trap / recession, it is possible to increase the money supply without causing inflation. This is because in recession, an increase in the money supply may just be saved, e.g. banks don't increase lending but just keep more bank reserves.

PHYSICAL QUALITY OF LIFE INDEX

The Physical Quality of Life Index (PQLI) is an attempt to measure the quality of life or well-being of a country. The value is the average of three statistics: basic literacy rate, infant mortality, and life expectancy at age one, all equally weighted on a 0 to 100 scale.

It was developed for the Overseas Development Council in the mid-1970s by Morris David Morris, as one of a number of measures created due to dissatisfaction with the use of GNP as an indicator of development. PQLI might be regarded as an improvement but shares

the general problems of measuring quality of life in a quantitative way. It has also been criticized because there is considerable overlap between infant mortality and life expectancy.

The UN Human Development Index is a more widely used means of measuring well-being.

Steps to Calculate Physical Quality of Life:

1) Find percentage of the population that is literate (literacy rate).

2) Find the infant mortality rate. (Out of 1000 births) INDEXED Infant Mortality Rate = (166 - infant mortality) × 0.625

3) Find the Life Expectancy. INDEXED Life Expectancy = (Life expectancy - 42) × 2.7

4) Physical Quality of Life = (Literacy Rate + INDEXED Infant Mortality Rate + INDEXED Life Expectancy) divided 3

TRADE CYCLE:

The economy tends to experience different trends. These can be categorized as the trade cycle and may feature boom, slump, recession and recovery

BOOM: A period of fast economic growth. Output is high due to increased demand, unemployment is low. Business confidence may be high leading to increased investment. Consumer confidence may lead to extra spending.

SLUMP: A period when output slows down due to a reduction in demand. Confidence may begin to suffer.

RECESSION: A period where economic growth slows down and the level of output may actually decrease. Unemployment is likely to increase. Firms may lose confidence and reduce investment. Individuals may save rather than spend.

RECOVERY: A period when the economy moves between recession and a boom.

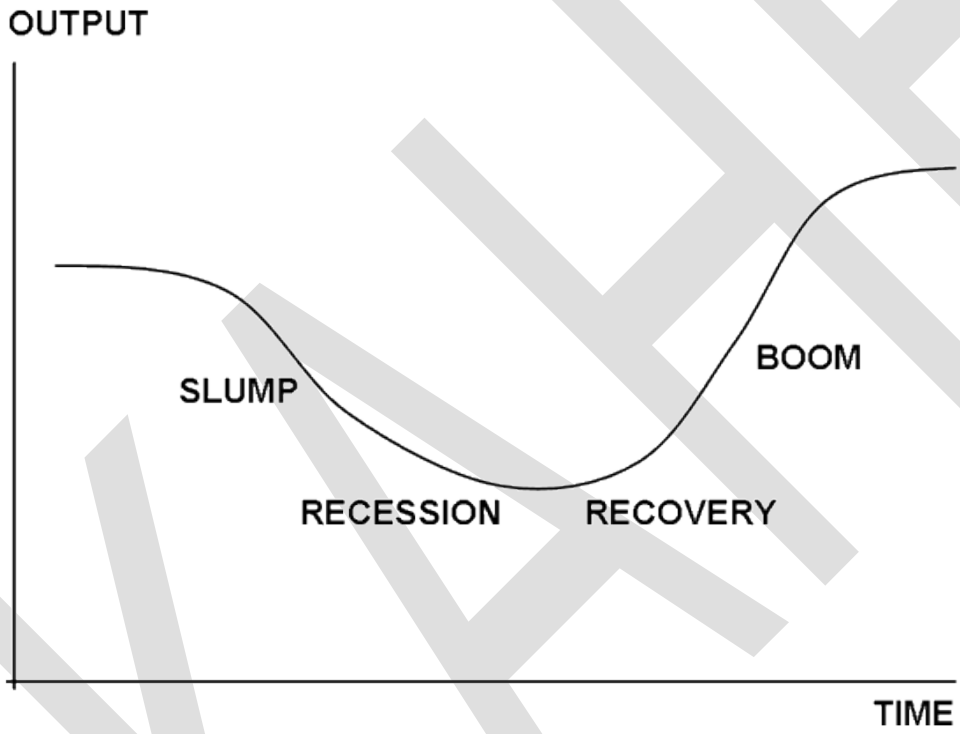
WHAT HAPPENS IN A BOOM?

1. Businesses produce more goods
2. Businesses invest in more machinery
3. Consumers spend more money. There is a FEELGOOD FACTOR

4. Less money is spent by the Government on unemployment benefits
5. More money is collected by the Government in income tax and VAT
6. Prices tend to increase due to extra demand

WHAT HAPPENS IN A RECESSION?

1. Businesses cut back on production
2. Some businesses may go bankrupt
3. Consumers spend less money. Fall in FEEL GOOD FACTOR
4. Individuals may lose their jobs and prices start to fall
5. More money is spent by the Govt on unemployment benefits
6. Less money is collected by the Govt in income tax and VAT



CAUSES OF TRADE CYCLE

Momentum effect

When there is positive economic growth, this tends to cause: A rise in consumer and business confidence. Rising asset prices such as houses; this causes a rise in wealth and consumer spending.

Interest Rate Changes

When there is higher economic growth, inflation tends to rise. In response, Central Banks tend to increase interest rates to reduce growth and inflation.

Technology

Improvements in technology may cause a boost in economic growth. A lull in technological innovation may cause slower growth.

Political Business cycle

Some economists suggest that there is a political business cycle. This is when politicians try to have a boom (high economic growth) before an election to help win the election.

Global Trade Cycle

A global economic downturn will tend to affect individual economies.

POSSIBLE QUESTIONS : PART – B

1. State the meaning of 'Inflation'.
2. What is meant by National Income?
3. Define the term 'Monetary Policy'.
4. Define the term 'Business Cycle'.
5. Give short note on Gross National Product.
6. What is the meaning of the term 'National Income"?
7. What are the characteristics of Business Cycle?
8. List out the methods of calculating the National Income.
9. What are the effects of Inflation on 'Producers'?
10. What do you mean by Macro Economic Policy?
11. Define the term Deflation.
12. Give short note on Monetary Policy.
13. State the meaning of the term 'National Income'.
14. What do you mean by 'Inflation'?
15. Define the term 'Fiscal Policy'.

***CIA – 3 X 2 = 6 Marks**
****ESE – 5 X 2 = 10 Marks**

PART – C

1. Discuss the important methods of measuring National Income.
2. Define the term 'Business Cycle' and describe the different phases of Business Cycle.
3. Define Inflation. Describe the characteristics and various types of Inflation
4. Define 'Fiscal Policy' and discuss the objectives and instruments of 'Fiscal Policy'.
5. What do you mean by Deflation? What are the effects of Deflation?
6. Define National Income and Explain the factors determining it.
7. Define the term Inflation and explain the anti – inflationary measures?
8. Explain the term 'Fiscal Policy'. What are the objectives and instruments of 'Fiscal Policy'?
9. What is National Income? How could the National Income be measured?
10. Discuss Keynes concept of Income and Employment.

***CIA – 3 X 8 = 24 Marks (EITHER OR TYPE)**
****ESE – 5 X 6 = 30 Marks (EITHER OR TYPE)**

Register No.: .....

[17BAU201]

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COIMBATORE – 641 021

First Internal Examination, January - 2018

I BBA – II Semester

MANAGERIAL ECONOMICS

Date : 19.01.2018 **Time: 2 Hours**

Session : FN **Maximum: 50 Marks**

PART – A (20 X 1 = 20 Marks)

Answer All the Questions

1. _____ is the process of transformation of inputs into goods and services of utility to consumers and producers

   a. Production b. Sales c. Purchases d. Costs

2. There are _____ factors of production

   a. four b. two c. three d. five

3. Scarcity definition is given by _____

   a. Robinson b. Adam Smith c. Alfred Marshall d. A.C. Pigou

4. Macro economics is otherwise called _____Economics

   a. Aggregative b. Regressive c. Individual d. Social

5. Micro Economics is concerned with specific _____

   a. Social Unit b. Science Unit c. Economic Unit d. Collection Unit

6. Law of demand establishes qualitative or directional relationship between _____

   a. demand and price b. demand and supply c. cost and price d. cost and income

7. If the demand curve is rectangular hyperbola, the elasticity is_____

   a. Relatively elastic b. Perfectively Inelastic c. Relatively Inelastic d. Unity

8. In a typical demand schedule, quantity demanded varies _____

   a. directly with price b. proportion with price c. inversely with price

   d. dependant with price

9. Which one is not a type of demand?

   a. Price demand b. Derived demand c. Joint demand d. Supply demand

10. A table indicating various levels of demand at various prices is termed as _____

    a. demand chart b. demand schedule c. demand table d. price table

11. Who introduced the concept of elasticity of demand?

    a. Adam Smith b. Robinson c. Marshall d. Joel Dean

12. The law of demand is a _____ statement

    a. Indicative b. qualitative c. Selective d. illustrative

13. Which is not the type of elasticity of demand?

    a. Price elasticity b. Income elasticity c. Cross elasticity d. Supply elasticity

14. The Cross elasticity of demand may be Substitute or _____

    a. Positive b. Negative c. Normative d. Complementary

15. Price elasticity of demand for luxury goods will be _____ elastic

    a. Infinitively b. relatively c. perfectively d. zero

16. A commodity demanded for its own sake by the final consumer is known as_____ goods.

    a. Consumer b. Producer c. Industrial d. Shopping

17. A final _____ is one who derives satisfaction from a good without any further value addition.

    a. Customers b. Traders c. Consumer d. Producers

18. Goods which create joint demand are _____ goods.

    a. Consumer b. Producer c. Industrial d. Complementary

19. Goods that compete with each other to satisfy any particular want are called _____

    a. Substitutes b. Producer c. Industrial d. Complementary

20. An _____ is the locus of all technically efficient combinations for producing a given level of output

    a. Isoquant b. Income c. Idea d. Isocost

PART – B (3 X 2 = 6Marks)

Answer All the Questions

21. Define Managerial Economics
22. What is meant by Market Equilibrium?
23. Who is the producer?

PART – C (3 X 10 = 30 Marks)

Answer All the Questions

24. a. Enumerate the price elasticity of Demand?

(or)

b. Determine the law of diminishing marginal productivity?

25. a. Explain the various concepts of Market Equilibrium?

(or)

b. Elaborate the properties of Isoquant curves?

26. a Define the term supply and explain the Law of supply with suitable examples?

(or)

b. Describe the Theory of Consumer Behavior ?

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40	17BAU041	Sivasakthi. L	Classification of Market
41	17BAU042	Sruthi. R	Perfect Competition – Effect of Changes in demand, Cost and Imposition of Taxes
42	17BAU043	Swathi. J	Marginal Productivity Theory
43	17BAU044	Tarun Kumar. R	Traditional Theory of Cost
44	17BAU045	Tony Akash. G. J	Kinked Demand Curve Model
45	17BAU046	Vasunthara. S	Long run Equilibrium of Firm / Industry
46	17BAU047	Venkatesh. A	Estimation of Cost of Product
47	17BAU048	Vennila. R	Comparison with Perfect and Monopoly Competition
48	17BAU049	Vetriselvan. K	Short run Equilibrium of Firm / Industry
49	17BAU050	Vidhya Shree. G	Elasticity of Demand
50	17BAU051	Vignesh. R	Theories of Inflation
51	17BAU052	Vignesh.C	Macro Economic Policy
52	17BAU053	Vigneshwaran. M	Theory of Trade Cycle
53	17BAU054	Vinodkumar. P	Law of Demand
54	17BAU055	Vinodkumar. P	Law of Supply
55	17BAU056	Wasim Agram. S	Factor Market – Market Equilibrium

KARPAGAM ACADEMY OF HIGHER EDUCATION
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COIMBATORE – 21
DEPARTMENT OF MANAGEMENT
I BBA - SECOND SEMESTER
MANAGERIAL ECONOMICS (17BAU201)
ASSIGNMENT - I – TITLES

Sl. No.	Register No.	Name of the Candidate	Assignment Title
1	17BAU002	Abinaya.D	Supply Function
2	17BAU003	Abisha.J	National Income Analysis
3	17BAU004	Aishwarya.S	Causes and Control of Inflation
4	17BAU005	Akshay K Ajay	Monetary and Fiscal Policies
5	17BAU006	Anto William . P	Income Elasticity of Demand
6	17BAU007	Aravind Kumar. P	Ordinal Utility Theory
7	17BAU008	Aravind. M	Price Elasticity of Demand
8	17BAU009	Balaji. P	Nature and Scope of Managerial Economics
9	17BAU010	Elavarasan. K	Cross Elasticity of Demand
10	17BAU011	Govarthini. S	Perfect Competition in the Product Market
11	17BAU012	Immanuvel. G	Three stages of Production
12	17BAU013	Jegadheesh Kumar. S	Determinants of Market Demand
13	17BAU014	Kannan. M	Price Discrimination
14	17BAU015	Kowsika. V	Theory of Trade Cycle
15	17BAU016	Kumar. C	Theory of Consumer Behaviour
16	17BAU017	Manikandan. G	Market Supply
17	17BAU018	Manikandan. M	Income Elasticity of Demand
18	17BAU019	Marimuthu. M	Elasticity of Supply
19	17BAU020	Mohammed Ameen . B	Analysis of Cost of Product
20	17BAU021	Nagoor mohideen. S	Modern Theory of Cost – Short run and Long run
21	17BAU022	Nagulan. R. V	Monopolistic Competition
22	17BAU023	Natarajan. S	Market Demand
23	17BAU024	Naveen. N	Keynesian Theory
24	17BAU025	Naveeth.R	Concepts of Trade Cycle
25	17BAU026	Pandiyan. S	Traditional Theory of Cost – Short run and Long run
Sl. No.	**Register No.**	**Name of the Candidate**	**Assignment Title**
26	17BAU027	Prabhakaran. D	Monopoly of Industries
27	17BAU028	Pradeesh. P	Oligopoly – Dominant Price Leadership Model
28	17BAU029	Praveenkumar. P	Marginal Utility Theory
29	17BAU030	Rajagopal. P	Revealed Preference Theory
30	17BAU031	Rajeshwari . K	Monopoly Competition in the Product Market
31	17BAU032	Ramasamy Ahilan	Monopoly – Basic Features, Short run and Long run Equilibrium
32	17BAU033	Riyazuddin.b	Theory of Firm / Market Organisation
33	17BAU034	Ruban Raj Kumar. K	Theories of Income
34	17BAU035	Sakthivel. E	Income effect for Normal, Inferior and Giffen Goods

35	17BAU036	Santhosh. N	Monopolistic Competition
36	17BAU037	Saranya.G	Cournot's Model – Oligopoly
37	17BAU038	Sheik Arfath. R	Theory of Income, Output and Employment
38	17BAU039	Sindhuja. R	Theory of Consumer Behaviour
39	17BAU040	Sivaram. C	New Classical Theory
40	17BAU041	Sivasakthi. L	Classification of Market
41	17BAU042	Sruthi. R	Perfect Competition – Effect of Changes in demand, Cost and Imposition of Taxes
42	17BAU043	Swathi. J	Marginal Productivity Theory
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I BBA - SECOND SEMESTER
MANAGERIAL ECONOMICS (17BAU201)
ASSIGNMENT - II – TITLES

Sl. No.	Register No.	Name of the Candidate	Assignment Title
1	17BAU002	Abinaya.D	National Income Analysis
2	17BAU003	Abisha.J	
3	17BAU004	Aishwarya.S	
4	17BAU005	Akshay K Ajay	
5	17BAU006	Anto William . P	
6	17BAU007	Aravind Kumar. P	
7	17BAU008	Aravind. M	
8	17BAU009	Balaji. P	
9	17BAU010	Elavarasan. K	
10	17BAU011	Govarthini. S	
11	17BAU012	Immanuvel. G	
12	17BAU013	Jegadheesh Kumar. S	
13	17BAU014	Kannan. M	
14	17BAU015	Kowsika. V	Elasticity of Supply
15	17BAU016	Kumar. C	

16	17BAU017	Manikandan. G	
17	17BAU018	Manikandan. M	
18	17BAU019	Marimuthu. M	
19	17BAU020	Mohammed Ameen . B	
20	17BAU021	Nagoor mohideen. S	
21	17BAU022	Nagulan. R. V	
22	17BAU023	Natarajan. S	
23	17BAU024	Naveen. N	
24	17BAU025	Naveeth.R	
25	17BAU026	Pandiyan. S	
26	17BAU027	Prabhakaran. D	
27	17BAU028	Pradeesh. P	
Sl. No.	**Register No.**	**Name of the Candidate**	**Assignment Title**
28	17BAU029	Praveenkumar. P	Perfect Competition – Effect of Changes in demand, Cost and Imposition of Taxes
29	17BAU030	Rajagopal. P	
30	17BAU031	Rajeshwari . K	
31	17BAU032	Ramasamy Ahilan	
32	17BAU033	Riyazuddin.b	
33	17BAU034	Ruban Raj Kumar. K	
34	17BAU035	Sakthivel. E	
35	17BAU036	Santhosh. N	
36	17BAU037	Saranya.G	
37	17BAU038	Sheik Arfath. R	
38	17BAU039	Sindhuja. R	
39	17BAU040	Sivaram. C	
40	17BAU041	Sivasakthi. L	
41	17BAU042	Sruthi. R	
42	17BAU043	Swathi. J	Long run Equilibrium of Firm / Industry
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44	17BAU045	Tony Akash. G. J	
45	17BAU046	Vasunthara. S	
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47	17BAU048	Vennila. R	
48	17BAU049	Vetriselvan. K	
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53	17BAU054	Vinodkumar. P	
54	17BAU055	Vinodkumar. P	
55	17BAU056	Wasim Agram. S	

Reg. No.....

[12BAU103]

KARPAGAM UNIVERSITY

(Under Section 3 of UGC Act 1956)
COIMBATORE – 641 021
(For the candidates admitted from 2012 onwards)

BBA DEGREE EXAMINATION, NOVEMBER 2012

First Semester

BUSINESS ADMINISTRATION

BUSINESS ECONOMICS

Time: 3 hours Maximum : 100 marks

PART A (15 X 2= 30 Marks)
Answer ALL the Questions

1. Define 'Economics' in the words of Marshall?
2. Explain the features of Business Economics?
3. What are the Objectives of Business Firms?
4. Define the term Demand?
5. What do you mean by the Law of Demand?
6. Explain the term market equilibrium?
7. What are the factors of production?
8. State about Isoquant Curves in production function?
9. List out the various types of costs?
10. What factors determine the size of the market?
11. What are the different types of price discrimination?
12. Illustrate how a monopoly firm fixes the price for its commodity?
13. What Factors determine National Income?
14. Illustrate the causes of Trade Cycle?
15. What do you mean by Fiscal policy of Macro Economics?

PART B (5 x 14 = 70 Marks)
Answer ALL the Questions

16. a. Define Business Economics and point out the Nature of Economics?

(Or)

b. Assess the role and responsibilities of Business Economists?

17. a. Analyze the term Demand Distinctions?

(Or)

b. Determine the significance of price elasticity of demand?

18. a. Define the Law of Diminishing Returns and illustrate the concept?

(Or)

b. Explain about the short run and long run cost of production?

19. a. Analyse the different forms of Market based on competitions?

(Or)

b. 'Under perfect competition the Firm is a price-taker and not price-maker' - Discuss

20. a. Define 'National Income' and explain the various components of National Income Accounting

(Or)

b. Determine the theories of Inflation and explain its controlling techniques?

Reg. No.....

[14BAU202]

KARPAGAM UNIVERSITY
(Under Section 3 of UGC Act 1956)
COIMBATORE - 641 021
(For the candidates admitted from 2014 onwards)

BBA DEGREE EXAMINATION, APRIL 2015
Second Semester

BUSINESS ADMINISTRATION

BUSINESS ECONOMICS

Time: 3 hours Maximum : 60 marks

PART – A (10 x 2 = 20 Marks)
Answer any TEN Questions

1. Define the term Social Responsibility.
2. List out the significance of business economics?
3. Write a short note on economic cost of using resources?
4. What is meant by demand forecasting?
5. State the meaning of Producer demand.
6. List out the Factors affecting elasticity of supply?
7. Mention the various types of costs?
8. What do you mean by Opportunity cost?
9. Give the meaning for the term Cost output relationship.
10. What factors determine the size of the market?
11. What is meant by Duopoly?
12. Define the term Perfect Competition.
13. Write a short note on National Income?
14. What is meant by Monetary Policies?
15. State the meaning of Net National Product (NNP).

PART B (5 X 8= 40 Marks)
Answer ALL the Questions

16. a. Explain the nature, scope, need and importance of Business Economics?

Or

b. Indicate the different economic concepts that are used in business decisions?

17. a. Briefly explain the elasticity of Supply with suitable examples.

Or

b. Elaborate the factors determining the elasticity of demand?

18 a. How Prices are fixed under short term and long term in Perfect competition with suitable examples ?

Or

b. Explain the Pricing under Oligopoly of Kinked Demand Curve Model.

19. a. "Trade Cycle is purely a monetary phenomenon"- Discuss it.

Or

b. Determine the concepts involved in Keynesian Theory.

20. **Compulsory** : -

Explain the assumptions of Law of Diminishing Marginal Utility with suitable diagram.

Reg. No.....

[15BAU304A]

KARPAGAM UNIVERSITY
Karpagam Academy of Higher Education
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COIMBATORE – 641 021
(For the candidates admitted from 2015 onwards)

BBA DEGREE EXAMINATION, NOVEMBER 2016
Third Semester

BUSINESS ADMINISTRATION

BUSINESS ECONOMICS

Time: 3 hours Maximum : 60 marks

PART – A (20 x 1 = 20 Marks) (30 Minutes)
(Question Nos. 1 to 20 Online Examinations)

PART B (5 x 8 = 40 Marks) (2 ½ Hours)
Answer ALL the Questions

21. a. Describe the various responsibilities of a General Manager?
Or
b. Determine the social responsibilities towards various business persons?

22. a. Define the term Supply and enumerate the factors influencing supply?
Or
b. Analyze the significance of Price elasticity of demand?

23. a. Determine the production function with two variable inputs?
Or
b. Explain the significance of different types of production function?

24. a. Enumerate the classification of market structure under various fields?
Or
b. Describe the features and significance of perfect competition?

25. a. How far is National Income a reliable index of Economic Welfare?
Or
b. Determine the Causes of Inflation and explain the measures to control Inflation?

Reg. No.....

[16BAU201]

KARPAGAM UNIVERSITY
Karpagam Academy of Higher Education
(Established Under Section 3 of UGC Act 1956)
COIMBATORE – 641 021
(For the candidates admitted from 2016 onwards)

BBA DEGREE EXAMINATION, APRIL 2017
Second Semester

BUSINESS ADMINISTRATION

MANAGERIAL ECONOMICS

Time: 3 hours Maximum : 60 marks

PART – A (20 x 1 = 20 Marks) (30 Minutes)
(Question Nos. 1 to 20 Online Examinations)

PART B (5 x 2 = 10 Marks) (2 ½ Hours)
Answer ALL the Questions

21. Write short note on income elasticity of demand.
22. Describe the concept of Geometry of product curve.
23. State the features of perfect market.
24. Discuss the factors determinants for a demand.
25. Define Business cycle, list out its characteristic features.

PART C (5 x 6 = 30 Marks)
Answer ALL the Questions

26. a. Explain the types of elasticity of demand.
(or)
b. Explain the Ordinal Utility theory.

27. a. Explain the law of diminishing marginal productivity.
(or)
b. Explain the various economies of scale.

28. a. Explain the types of oligopoly.
(or)
b. Explain the various types of price discrimination.

29. a. Describe the market supply of labour.
(or)
b. Explain the factor market equilibrium

30. a. Discuss the Approaches To Calculate National Income:
(or)
b. Discuss the causes and control measures of the inflation.

Register No.: …….

[17BAU201]

KARPAGAM ACADEMY OF HIGHER EDUCATION
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COIMBATORE – 641 021
First Internal Examination, January - 2018
I BBA – II Semester

MANAGERIAL ECONOMICS – Answer Key
PART – A

1. Production
2. Four
3. Robinson
4. Aggressive
5. Economic Unit
6. Demand and Price
7. Unity
8. Inversely with price
9. Supply Demand
10. Demand Schedule
11. Marshall
12. Qualitative
13. Supply Elasticity
14. Positive
15. Relatively
16. Consumer
17. Consumer
18. Complementary
19. Substitutes
20. Isoquant

PART – B

21. Define Managerial Economics

In simple words, business economics is the discipline which helps a business manager in decision making for acheiving the desired results. In other words, it deals with the application of economic theory to business management. According to **Spencer and Siegelman**, Business economics is "the integration of economic theory with business practise for the purpose of facilitating decision- making and forward planning by management". According to Mc **Nair and Meriam**, "Business economics deals with the use of economic modes of thought to analyse business situation".

From the above said definitions, we can safely say that business economics makes in depth study of the following objectives:

ii) Explanation of nature and form of economic analysis

(ii) Identification of the business areas where economic analysis can be applied

(Hi) Spell out the relationship between Managerial Economics and other disciplines outline the methodology of managerial economics.

22. What is meant by Market Equilibrium?

Market equilibrium is a market state where the supply in the market is equal to the demand in the market. The equilibrium price is the price of a good or service when the supply of it is equal to the demand for it in the market.

where quantity demanded and quantity supplied is equal at a given time and price. There is no surplus or shortage in this situation and the market would be considered stable. In other words, consumers are willing and able to purchase all of the products that suppliers are willing and able to produce. Everyone wins.

It considered a balance and is comprised of 3 properties.

1. The behavior is consistent
2. Each participant has no incentive to modify its behavior
3. The outcome is due to some dynamic process

Although this situation rarely happens in real life, economists use this as the basis for many economic theories.

23. Who is the producer?

Producer goods**,** also called intermediate goods**,** in economics, goods manufactured and used in further manufacturing, processing, or resale. Producer goods either become part of the final product or lose their distinct identity in the manufacturing stream. The prices of producer goods are not included in the summation of a country's gross national product (GNP), because their inclusion would involve double counting of costs and lead to an exaggerated estimate of GNP. Only the price of final consumer goods is included in the GNP. The contribution of producer goods to the GNP may be determined through the value-added method. This method calculates the amount of value added to the final consumer good by each stage of the production process. When the values added at all stages of production have been established, they are summed to estimate the total value of the final product.

PART – C

24. a. Enumerate the price elasticity of Demand?

Elasticity is a common concept that economists, Business people and others rely upon for the measurement between two variables say for example the ratio of percentage change in quantity demanded to percentage change in some other factor like Price or Income. The concept of price-elasticity of demand was first of all introduced in

economics by Dr. Marshall. In simple words, price elasticity of demand is the ratio of percentage change in quantity demanded to the percentage change in price. In other words, price elasticity of demand is a measure of the relative change in quantity purchased of a good in response to a relative change in its price. It is, thus a rate at which the demand changes to the given change in prices. So, it means the rate or the degree of response in demand to the change in price. Thus, the co-efficient of price-elasticity of demand can be expressed as under:

$$\frac{\text{Pr } \textit{oportionat e change in Quantity Demanded}}{\text{Pr } \textit{oportionat e change in price}}$$

Definitions of Price Elasticity of Demand

The concept of price elasticity of demand has been defined by different economists as under :

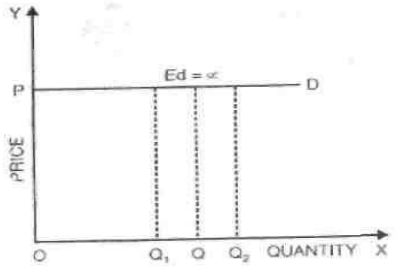
According to **Alfred Marshall**: "Elasticity of demand may be defined as the percentage change in quantity demanded to the percentage change in price."

Different commodities have different price elasticities. Some commodities have more elastic demand while others have relative elastic demand. Basically, the price elasticity of demand ranges from zero to infinity. It can be equal to zero, less than one, greater than one and equal to unity.

According to **Dr. Marshall** : "The elasticity or reponsiveness of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price and diminishes much or little for a given rise in price." However, some particular values of elasticity of demand have been explained as under ;

Perfectly Elastic Demand.

Perfectly elastic demand is said to h appen when a little change in price leads to an infinite change in quantity demanded. A small rise in price on the part of the seller reduces the demand to zero. In such a case the shape of the demand curve will be horizontal straight line as shown in the following figure



The above figure shows that at the ruling price OP, the demand is infinite. A slight rise in price will contract the demand to zero. A slight fall in price will attract more consumers but the elasticity of demand will remain infinite. But in real world, the cases of perfectly elastic demand are exceedingly rare and are not of any

practical interest.

1. **Perfectly inelastic Demand**

Perfectly inelastic demand is opposite to perfectly elastic demand. Under the perfectly inelastic demand, irrespective of any rise or fall in price of a commodity, the quantity demanded remains the same. The elasticity of demand in this case will be equal to zero. In diagram 14, DD shows the perfectly inelastic demand. At price OP, the quantity demanded is OQ. Now, the price falls to OP, from OP_1, demand remains the same. Similarly, if the price rises to OP_2 the demand still remains the same. But just as we do not see the example of perfectly elastic demand in the real world, in the same fashion it is difficult to come across the cases of perfectly inelastic demand because even the demand for bare essentials of life does show some degree of responsiveness to change in price.

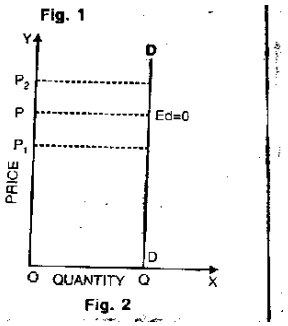
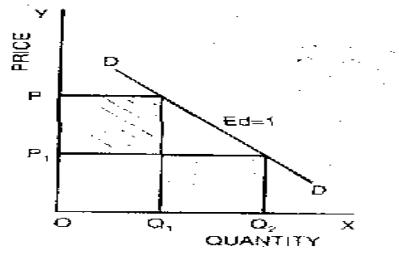


Fig. 2

3. Unitary Elastic Demand. The demand is said to be unitary elastic when a given proportionate change in the price level brings about an equal proportionate change in quantity demanded, The numerical value of unitary elastic demand is exactly one i.e., ed = 1. Marshall calls it unit elastic. In the following figure DD demand curve represents unitary elastic demand. This demand curve is called rectangular hyperbola. When price is OP, the quantity demanded is OQ_1. Now price falls to OP_1, the quantity demanded increases to OQ_1. The shaded area in the fig. equal in terms of price and quantity demanded denotes that in all cases price elasticity of demand is equal to one.



4. Relatively Elastic Demand

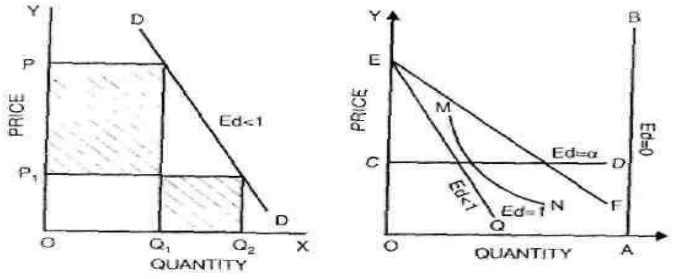
Relatively elastic demand refers to a situation in which a small change in price leads to a big change in quantity demanded. In such a case elasticity of demand is said to be more

than one. This has been shown in the following figure In fig., DD is the demand curve which indicates that when price is OP the quantity demanded is OQ_1, Now the price falls from OP to OP_1, the quantity demanded increases from OQ_1 to OQ_2 i.e. quantity demanded changes more than the change in price.

5. Relatively Inelastic Demand

Under the relatively inelastic demand a given percentage change in price produces relatively less percentage change in quantity demanded. In such a case elasticity of demand is said to be less than one as shown in the following figure All the five degrees of elasticity of demand have been shown in the following figure . On OX axis, quantity demanded and on OY axis price is given. It shows:

1. AB — Perfectly Inelastic Demand
2. CD — Perfectly Elastic Demand
3. EQ — Less Than Unitary Elastic Demand
4. EF — Greater Than Unitary Elastic Demand
5. MN — Unitary Elastic Demand.



24. b. Determine the law of diminishing marginal productivity?

Law of diminishing returns explains that when more and more units of a variable input are employed on a given quantity of fixed inputs, the total output may initially increase at increasing rate and then at a constant rate, but it will eventually increase at diminishing rates. In other words, the total output initially increases with an increase in variable input at given quantity of fixed inputs, but it starts decreasing after a point of time.

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

According to F. Benham, "As the proportion of one factor in a combination of factors is increased, after a point, first the marginal and then the average product of that factor will diminish."

In the words of Alfred Marshall, "An increase in the Capital and Labour applied in the cultivation of land causes, in general, less than proportionate increase in the amount of produce raised unless it happens to coincide with an improvement in the art of agriculture."

The assumptions made for the application of law of diminishing returns are as follows:

i. Assumes labor as an only variable input, while capital is constant

ii. Assumes labor to be homogeneous

iii. Assumes that state of technology is given

iv. Assumes that input prices are given

This output-labor relationship can be represented in the tabular form of a production function, which is shown in

Table-3: Output-Labor Combinations

No. of Workers (L)	Total Product (TP_L)	Marginal Product (MP_L)	Average Product (AP_L)	Stages of Production (on the basis of MP_L)
1	49	49	49	Increasing returns
2	152	103	76	
3	303	151	101	
4	496	193	124	
5	725	229	145	
6	984	259	164	
7	1267	283	181	
8	1568	301	196	
9	1881	313	209	
10	2200	319	220	
11	2519	319	229	
12	2832	313	236	Diminishing returns
13	3133	301	241	
14	3416	283	244	
15	3675	259	245	
16	3904	229	244	
17	4097	193	241	
18	4248	151	236	
19	4351	103	229	
20	4400	49	220	
21	4389	-11	209	Negative returns
22	4312	-77	196	

The above table shows that total product represents the value of Q (output) obtained by substituting different values of L in the production function $Qc = -L^3 + 30L^2 + 20L$. Marginal product refers to the product obtained by increasing one unit of input. In present case, the change in total quantity of product by including one more worker is termed as marginal product of labor.

In the above Table, last column shows the three stages of production, which are explained as follows:

i. Stage I: Refers to the stages of production in which the total output increases initially with the increase in number of labor table-3 shows the increase in marginal product till the number of workers increased to 10 and 11. The marginal output produced by tenth and eleventh worker is same, which implies that they yield constant returns.

ii. Stage II: Refers to the stage in which total output increases but marginal product starts declining with the increase in number of workers. The table shows the declining of marginal product as the number of workers reaches 12.

iii. Stage III: Refers to the stages in which the total product starts declining with an increase in number of workers. As shown in Table, the total output reaches to maximum level at the twentieth worker. After that, the total output starts declining.

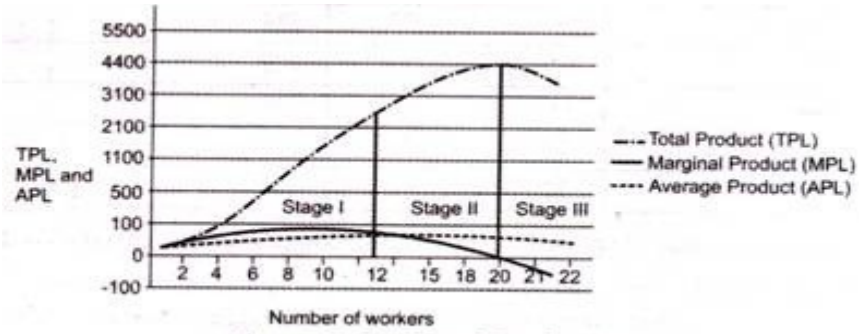


Figure-2: Stages of Production

There are two types of laws that work in the three stages of production. One is law of increasing returns in stage I and law of diminishing returns in stage II. There are several factors that are responsible for the application of these laws. Among these factors, one of the most important factors for the law of increasing returns is fixed capital. Less number of labor lead to unutilized capital, because capital is indivisible.

For example, if the capital-labour ratio is 2:6 and capital is indivisible and labor hired is less than six, then capital is unutilized. Another important factor responsible for the increase of labor productivity is division of labor. This can be achieved by hiring more workers to reach the maximum output or optimum capital-labor ratio. Beyond the optimum capital-labor ratio, there would be no effect of an increased labor on the productivity of labor because labor can substitute capital to a limited extent. This leads to an increase in the number of workers to compensate the decrease in capital and capital-labor ratio.

Significance of Law of Diminishing Returns:

The law of diminishing returns can be applied in a number of practical situations. The law has implication in most of the productive activities, but cannot be applied in all productive activities. Therefore, it cannot be applied universally. The application of this law has been seen more in agricultural production rather than industrial production.

This is because the inputs in agriculture production are natural, while in industrial production, inputs are generally manmade. Therefore, if increasing variable input is applied to fixed inputs, then the marginal returns start declining.

Law of diminishing returns helps mangers to determine the optimum labor required to produce maximum output. In addition, with the help of graph of law of diminishing returns, it becomes easy to analyze capital-labor ratio. If an organization falls in stage I of production, it implies that its capital is underutilized.

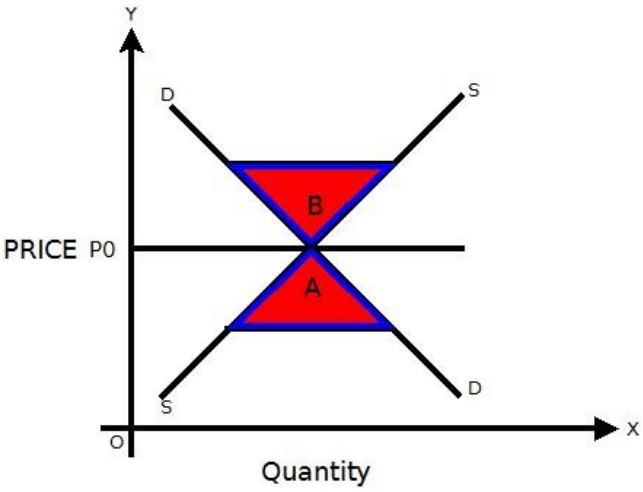
Therefore, the organization needs to increase the number of workers. In case, the organization is in stage III; it implies that the organization needs to reduce number of workers. However, stage I and stage III are irrelevant for managers for setting the targets of output.

Only stage II is used for this purpose because this stage provides information about the number of workers that need to be employed for reaching the maximum level of production. The decision regarding the employment of workers and setting the maximum level of output would only be possible when wage rate is known.

25. a. Explain the various concepts of Market Equilibrium?

The word equilibrium is derived from the Latin word aequilibrium which means equal balance. Its use in economics is imported from physics. In physics it means a state of even balance in which opposing forces or tendencies neutralize each other. Prof. Stigler defines equilibrium in his sense in these words:" equilibrium is a position from which there is no net tendency to move, we say net tendency to emphasize the fact that it is not necessarily a state at sudden inertia but may instead represent the cancellation of power forces. In economics, equilibrium implies a position of rest characterized by absence of change.

Market equilibrium, for example, refers to a condition where a market price is established through competition such that the amount of goods or services sought by buyers is equal to the amount of goods or services produced by sellers. It is the point at which quantity demanded and quantities supplied are equal. This price is often called the equilibrium price or market[1]clearing price and will tend not to change unless demand or supply change.



Price of market balance:

- **P - price**
- **Q - quantity of good**
- **S - supply**
- **D - demand**
- **P0 - price of market balance**
- **A - surplus of demand - when P<P0**
- **B - surplus of supply - when P>P0**

Static Equilibrium

"According to Prof. Mehta". "Static equilibrium is that equilibrium which maintains itself outside the period of time under consideration ". It is state of bliss which every individual firm, industry or factor wants to attain and once reached, would not like to leave. Consumer is in equilibrium when he gets maximum satisfaction from a given expenditure on different goods and services.Any move on this part to reallocate his expenditure among his purchases will decrease rather than increase his total satisfaction. A firm is in equilibrium when its profit is the maximum and it has no incentive to expand or contract its output. It is a position in which neither the adjusting firms have any tendency to live nor for new firms to enter the industry. In other words, an industry is in equilibrium when all firms are earning only normal profits.

Static equilibrium is of three types:

1. **Micro static**.

2. **Macro static and**
3. **Comparative static**

Micro static:

An economic model refers to relationship among different variables in which one variable appears in more than one relationship. In the micro static models of price determination, supply and demand relationship determine price at a point of time which are also constant through time. The given demand and supply functions are

D= (P) ----- I

S= (P) ----II

Where,

D = demand

P = price

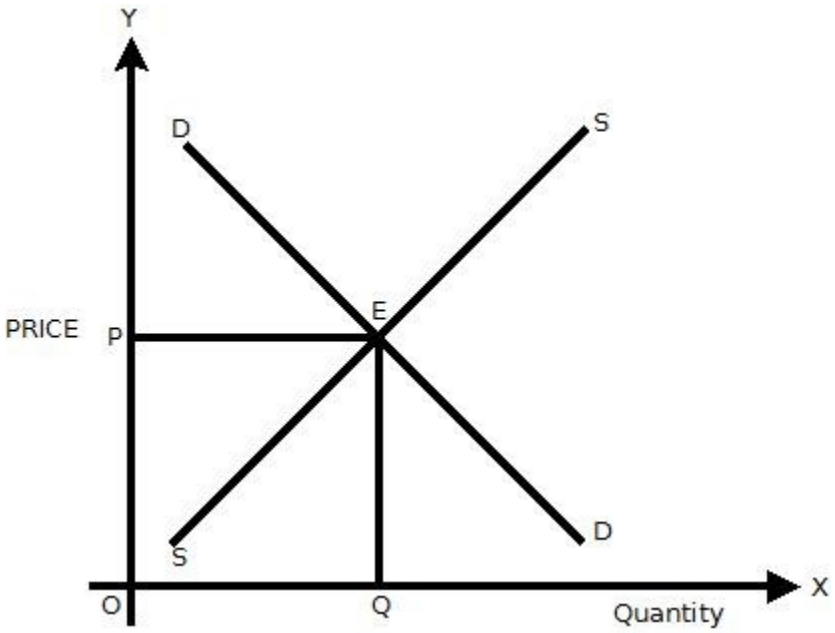
S = supply

The equation I shows that demand is inversely proportional to price i.e. if price decrease the demand will rise and if price increases, the demand will fall keeping other things constant. On the other hand equation II shows that supply is also the function of price i.e. if price increase supply will rise and if price decrease supply will fall, other things remaining constant.

From equations I and II

D=S ------III

The micro static relationship is illustrated with the help of diagram.



The above diagram shows DD and SS the demand and supply curves respectively. They intersect at point E where quantities of demand and supplied equals to OQ at price OP. This is static analysis of price determination, for all variables such as quantity supplied, quantity demanded and price refer to the same point or period of time.

Generally, the economists are interested in the equilibrium values of the variables which are attained as a result of the adjustment of the given variables to each other. That is why economic theory has sometimes been called equilibrium analysis. Till recently, the whole price theory in which we explain the determination of equilibrium prices of the products and factors in different market categories were mainly static analysis. The values of the various variables such as demand, supply, and price were taken to be relating to the same point or period of time.

Macro-Static:

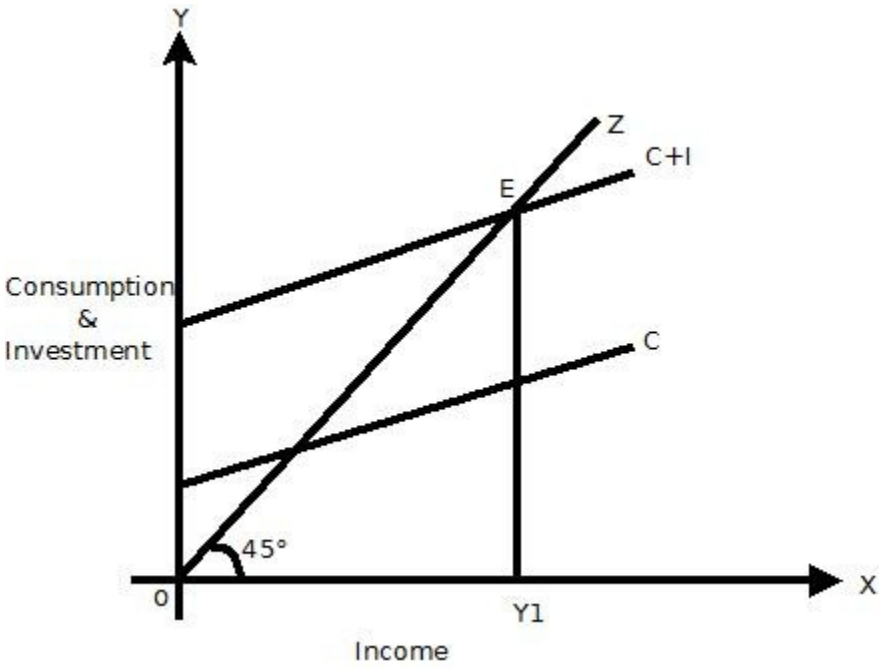
The concept of **Macro-Static** explains the static equilibrium position of the economy. This concept is best explained by Prof. Kurihara in these words: “If the object is to show a still picture of the economy as a whole, the macro-static method is the appropriate technique.. This technique is one of investigating the relations between macro-variables in final position of equilibrium

without reference to the process of adjustment implicit in that final position". Such a final position of equilibrium may be shown by the equation Y = C + I

Where, Y = Total Income

C = Total consumption expenditure

I = Total Investment expenditure



In a static Keynesian model, the level of equilibrium is determined by the interaction of aggregate supply function and the aggregate demand function. In diagram OZ shows aggregate supply function and C + I line represents aggregate demand function. The line OZ and C + I intersect at point E, which determines equilibrium level of income at OY_1. It simply shows a timeless identity equation without any adjusting mechanism.

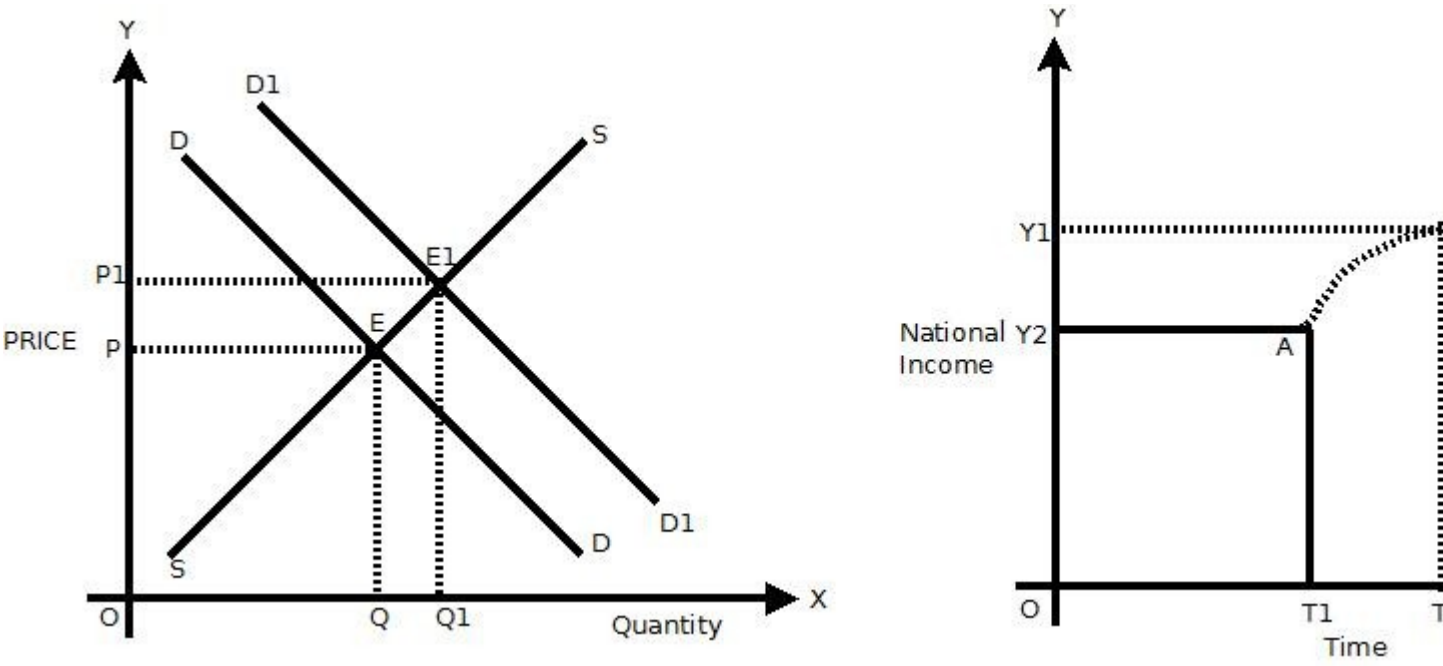
Comparative Static:

A **Comparative Static** analysis compares one equilibrium position with another when data have changed and system has finally reached another equilibrium position. It does not show how the system has reached the final equilibrium position with a change in data. It merely explains and compares the initial equilibrium position with the final one reached after the system has adjusted to a change in data.

Thus, in comparative static analysis, equilibrium positions corresponding to different sets of data are compared.

Let us see few examples of comparative static analyses.

Consider our previous example of static analysis of demand and supply which determine the equilibrium quantity and price. We can thus think of an analysis in which we start with a system in equilibrium. We now introduce a change and study the ultimate effect of a change. This can be explained with the following diagram



The original equilibrium between DD the demand curve and SS the supply curve is at E_1. When demand increases to D_1D_1, as a result of increase in income, the new equilibrium is at E_2 at the price OP_2. In comparative static analysis, we are concerned only with explaining the new equilibrium position at point E_2 and comparing it with E_1. We are not concerned with the whole path the system has travelled from E_1 to E_2. Alfred Marshall has made extensive use of comparative static in his time-period analysis of pricing under perfect competition.

Although the dynamic analysis of the two equilibrium positions with different sets of data is more comprehensive and informative.

Limitations of Comparative Statics Analysis

- It fails to predict the path which the market follows when moving from one equilibrium position to another.
- It cannot predict whether or not a given equilibrium position will ever be achieved. For this purpose we need dynamic analysis.

Dynamic Equilibrium

When after a fixed period the equilibrium state is disturbed it is called dynamic equilibrium.

In dynamic equilibrium prices, quantities, incomes, tastes, technology etc are constantly changing.

For e.g. suppose some more persons develop the taste for fish, s a result the demand for fish will increase seller will at once raise the price and thus change the behavior of the old buyers. The market will be thrown into a state of disequilibrium and will remain so till the supply of fish is increased to the level of the new demand. When new equilibrium will be brought in by the forces contenting forces.

The word dynamic means causing to move. In economics, 'dynamic' refers to the study of economic change. The essence of any knowledge lies in formulating relationships between phenomena. There must be thus sequence of events for the knowledge to be born. The main purpose is to know as to how complex of current events will shape itself I the future. To do so it is necessary to visualize the way it has itself arisen out of the past events. The moment we talk of sequence of events, the elements of time creeps into our analysis. Economics is thus a process of change through time.

Dynamic equilibrium is of two types

1. **Micro Dynamic equilibrium**
2. **Macro Dynamic equilibrium**

Micro-Dynamics (cobweb)

It is used to explain the dynamics of demand, supply and price over long period of time. The cob-web model (or Theorem) analyses the movements of prices and outputs when supply is wholly determined by prices in the previous period.

As prices moves up and down in cycles, quantities produced and also seem to move up and down in a counter-cyclical manner (e.g. prices of perishable commodities like vegetables).

In order to find out the conditions for converging, diverging or constant cycles: one has to look at the slope of the demand curve and then of the supply curve.

Assumption

1. The cob-web Model is based on the following assumption:

2. The current year's (t) supply depends on the last year's ($_{t-1}$) decisions regarding output level.
3. Hence current output is influenced by last year's price. i.e. P ($_{t-1}$)
4. The current period or year is divided into sub-periods of a week or fortnight.
5. The parameters determining the supply function have constant values over a series of periods.
6. Current demand (Dt) for the commodity is a function of current price (Pt).
7. The price expected to rule I the current period is the actual price in the last year.
8. The commodity under consideration is perishable and can be stored only for one year.
9. Both supply and demand function are linear .i.e. both are straight line curves which increases or decreases at a constant proportion.

The Cob-web Model

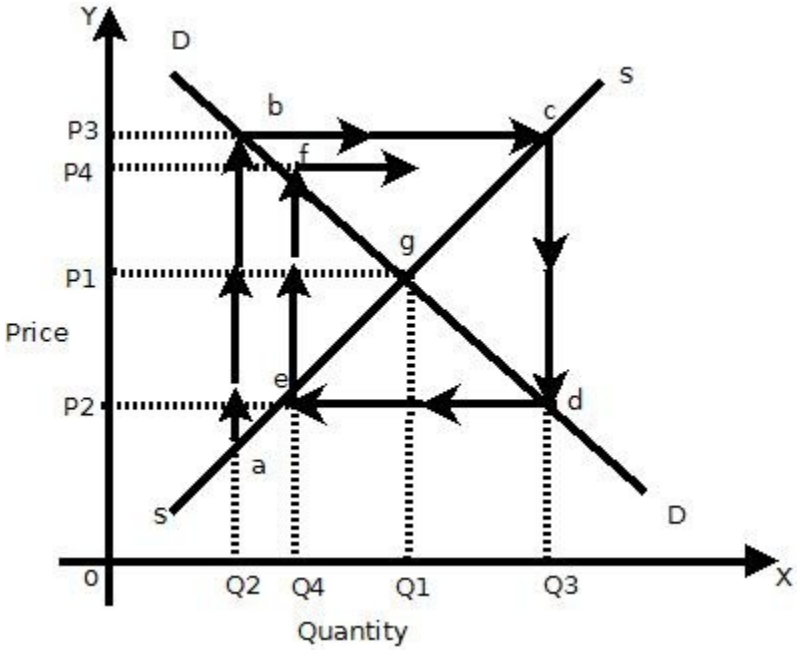
There are two types of Cob-web Models:

1. **Convergent**
2. **Divergent**
3. **Continuous**

(1) Convergent Cob-web

Under this model the supply is a function of previous year i.e. S= f ($_{t-1}$) ('t' is the current period and'$_{t-1}$' is a previous period) and on the other hand the demand is the function of price i.e. D_t=f (P). The equality between the quantity supplied and quantity demand is called as Market equilibrium.i.e. S_t=D_t. Equilibrium can be established only through a series of adjustment if current supply is in response to the price during the last year. But this adjustment will take place over a several consecutive periods.

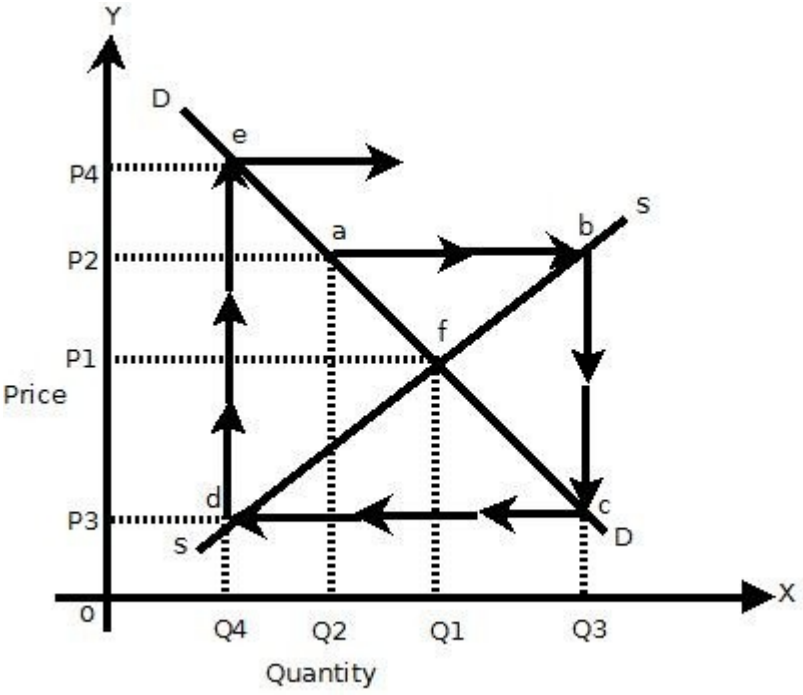
For e.g. suppose we take the example of onion growers who is producing one crop in a year. The onion growers will grow this year on the assumption that the price of onions this year will be equal to price in the last year. The market demand and supply curves for onions are represented by DD and SS curves respectively in diagram.



Suppose the price in the last year was OP_1 and Producers decide the equilibrium output OQ_1 this year. Now suppose there is crop failure due to natural calamities which decrease the output OQ_2 which is less than OQ_1 (i.e. equilibrium output). Lack of supply will increase the price to OP_2 in the current period. In the next period, the onion growers will produce OQ_3 quantity in response to the higher price OP_2.But this is more than the equilibrium quantity OQ1 which is the actual need of the market. The excess supply will lower the price to OP_3. This will encourage the producer to change the producer plan, where they will reduce the supply to OQ4 in the third period. But this quantity is less than the equilibrium quantity OQ_1. This will lead to again rise in price to OP_4, which in turn will encourage the producers to produceOQ_1 quantity. The equilibrium will be established at point g where DD and SS curves intersect. This series of adjustments from point a,b,c,d,and e to f is traced out as a cobweb pattern which converge towards the point of market equilibrium g. This is also called as the dynamic equilibrium with lagged adjustment.

(2) Divergent Cob-Web

The divergent cob-web is unstable cobweb when price and quantity changes move away from the equilibrium posting. This can be explained with the help of following diagram,

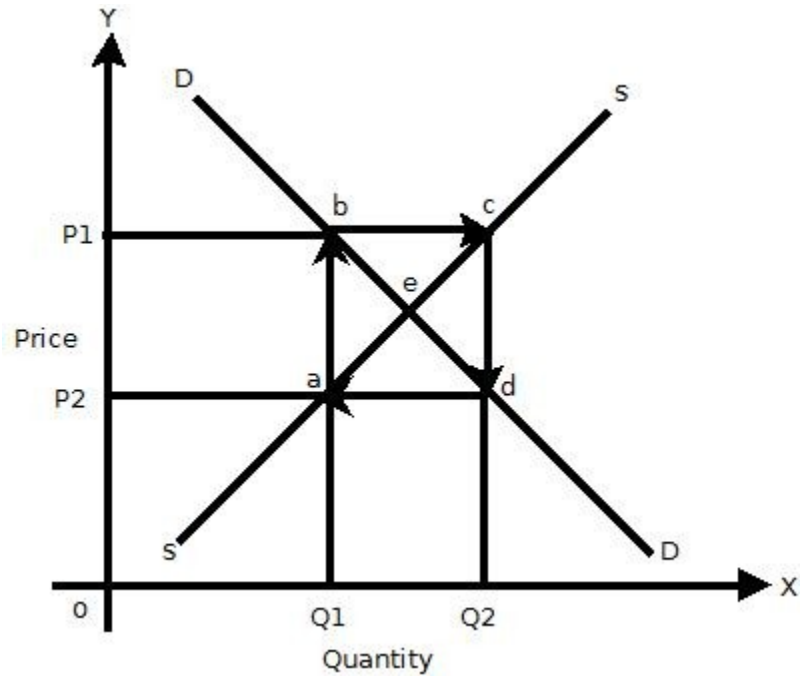


We will start with the initial equilibrium price is OP_1 and equilibrium quantity OQ_1. Now suppose there is a temporary disturbance that causes output to fall to OQ_2. Due to lack of supply the price will rise to OP_2.

The increase in price will in turn raise the output to OQ_3 which is more than the equilibrium output OQ_1. The increase in supply will lead to fall in price to OP_3. This fall in price will increase the demand and there will be excess demandOQ_2 than supply. The excess demand will shoot up the price to OP_4. This shows that the price will be still away from the equilibrium after the adjustment by the producers. This is called as Divergent cob-web.

(3) Continuous cob-web

The cob-web models in this show the continuous changes in price and quantities.



Suppose we start with the price OP_1 as shown in the diagram. As the supply will be more due to high price in the market. On the other hand the demand will be less as compared to the supply OQ_2 and the demand will reduced to OQ2. The fall in demand will force the producer to decrease price to OP_2 in next period. But at this price OP_2 the demand will be OQ_2 which is more than the supply OQ1 which reduced. This way the prices and quantities will circulate constantly around the equilibrium.

Macro-Dynamics (cobweb)

According to Kurihara," 'Macro-Dynamics' treats discrete movements or rates of change of macro-variables. It can be explained in terms of the Keynesian process of income propagation (the investment multiplier) where consumption depends on income i.e. $C = f(Y_{t-1})$

Where

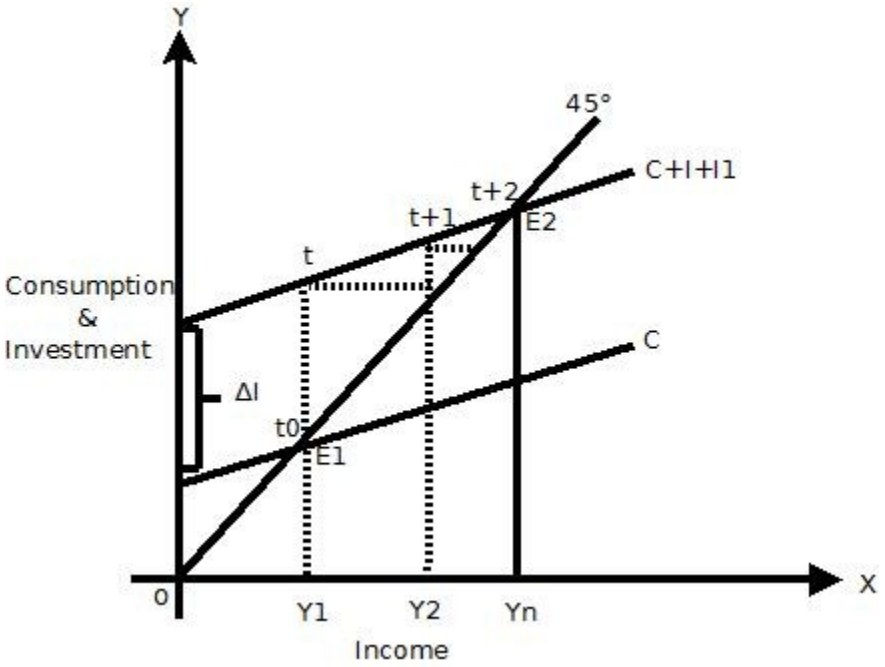
C = Consumption

Y = Income

f = function

The function shows that the consumption in the current period (t) depends on the Y in the previous period ($_{t-1}$). On the other hand investment is a function of time and of constant autonomous investment ΔI (Autonomous investment is the investment which does not changes due to changes in income.i.e. changes in investment does not take place due to change in income).For e.g. government does the investment for welfare of the people and not for profit

expectation. So investment function can be written as It = f (Δ I). This can be explained with the following diagram.

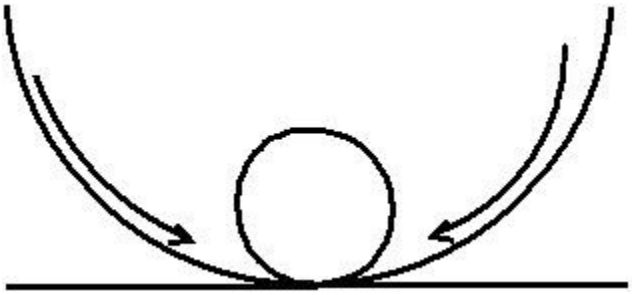


The above diagram shows that C is the aggregate demand function and 45^0 degree line is the aggregate supply function. Suppose we start with the time period t_0 where with an equilibrium level of income OY_1, investment increased from I_0 to I_1, this can be seen by the new aggregate demand function line C + I + I_1.But in period t, consumption lags behind and it is still on the equilibrium point E_1. In next period $_{t+1}$ consumption increased with the increase in investment, which lead to increase in income from OY_1 to OY_2. This is the process of income prorogation which will continue till the aggregate demand function C + I + I_1 intersects the aggregate function 45^0 line at point E_2 in the nth period. The new equilibrium level of income is at OY_n. The curved steps from t_0 to E_2 show the macro-dynamic equilibrium path.

(1) Stable Equilibrium

Equilibrium is said to be stable when the economy is disturbed on which it depends and again resume to its original position that is the disturbance in the equilibrium is self adjusting so that the original equilibrium is restored. This stable equilibrium can be seen with the diagram. In words of Marshall "When the demand price is equal to the supply price, the amount produced has no tendency either to be increased or to be diminished, it is an equilibrium. Such equilibrium is stable: that is, the price, if displaced a little from it, will tend to return, as a pendulum oscillates about its lowest point. Another famous simile is that of a bowl and a bowl given by

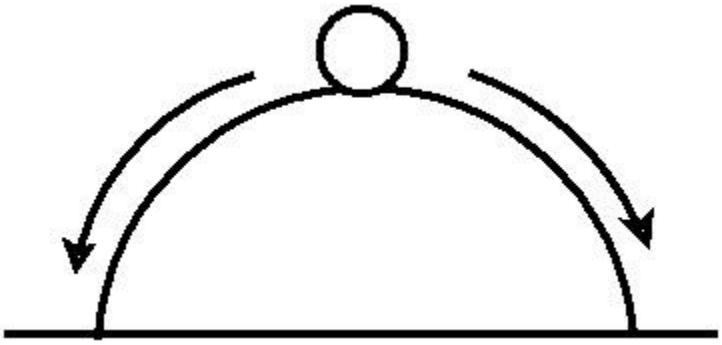
Schumpeter. A bowl that rest in a bowl is in stable equilibrium because if disturbed it will eventually come to the rest in its initial position after moving back and forth.



(2) Unstable Equilibrium

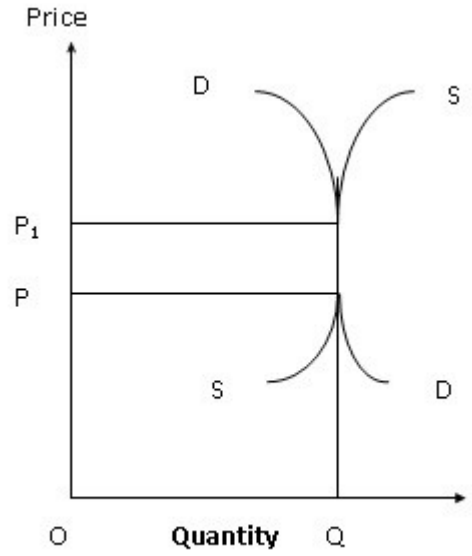
In case of unstable equilibrium the disturbance in the economy will lead or exaggerate the further disturbances will never to its original position.In Pigou's words, "If the small disturbance calls out further disturbing forces which act in a cumulative manner to drive the system from its initial postion," it is in unstable equilibrium. "As an egg if balanced on one of its ends would at the smallest shake fall down, and lie length ways, "as pointed out by Marshall. If the bowl is inverted and the ball is perched on its top, it will be in unstable equilibrium. For once the ball is pushed; it falls off the top of the bowl to the ground and does not return to its original position, as shown in figure.

Another type of equilibrium generally referred to is neutral equilibrium.According to Prof. Pigou, "An egg lying on its side is in neutral equilibrium." The static neutral equilibrium condition is illustrated in fig. and the dynamic in figure. In fig E is the initial equilibrium point where OQ quantity is demanded and supplied at OP price. With the rise in the price to OP1, E1 becomes the new equilibrium point but the quantity demanded and supplied remains the same, i.e. OQ. Thus, the price range PP1 (=EE1) represents neutral equilibrium.Neutral equilibrium is when the disturbing forces neither bring it back to the original position nor do they drive it further away from it. It rests where it has been moved. Thus, in the case of a neutral equilibrium, the object assumes once for all a new position after the original position is disturbed.



(3) Neutral Equilibrium

Neutral equilibrium is when the disturbing forces neither bring it back to the original position nor do they drive it further away from it. It rests where it has been moved. When an initial equilibrium position is disturbed, the forces of disturbance bring it to the new position of equilibrium where the system has come to rest. A ball on the billiard table if disturbed will come to rest at the new position to which it has moved. According to Prof. Pigou, "An egg lying on its side is in neutral equilibrium." The static neutral equilibrium condition is illustrated in figure.



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Partial Equilibrium

Partial equilibrium analysis is the analysis of an equilibrium position for a sector of the economy or for one or several partial groups of the economic unit corresponding to a particular set of data.Partial or particular equilibrium analysis, also known as micro economic analysis, is the study of the equilibrium position of an individual, a firm, an industry or a group of industries viewed in isolation. In other words, this method considers the changes in one or two variables keeping all others constant, i.e., ceteris paribus (others remaining the same). The ceteris paribus is the crux of partial equilibrium analysis.For Example

(a) Consumer's Equilibrium: With the application of partial equilibrium analysis, consumer's equilibrium is indicated when he is getting maximum aggregate satisfaction from a given expenditure and in a given set of conditions relating to price and supply of the commodity.
The conditions are: 1) the marginal utility of each good is equal to its price (P), i.e.

$$\frac{MU_A}{P_A} = \frac{MU_B}{P_B} = \ldots\ldots = \frac{MU_N}{P_N};$$

And (2) the consumer must spend his entire income (Y) on the purchase of goods, i.e.

$$Y = P_A Q_A + P_B Q_B + \ldots\ldots\ldots + P_N Q_N .$$

It is assumed that his tastes, preferences, money income and the prices of the goods he wants to buy are given and constant.

(b) Producer's Equilibrium: A producer is in equilibrium when he is able to maximise his aggregate net profit in the economic conditions in which he is working.

(c) Firm's Equilibrium: A firm is said to be in long-run equilibrium when it has attained the optimum size when is ideal from the viewpoint of profit and utilization of resources at its disposal.

(c) Industry's Equilibrium: Equilibrium of an industry shows that there is no incentive for new firms to enter it or for the existing firms to leave it. This will happen when the marginal firm in the industry is making only normal profit, neither more nor less. In all these cases; those who have incentive to change it have no opportunity and those who have the opportunity have no incentive.

***Assumptions**

1. Commodity price is given and constant for the consumers.
2. Consumer's taste and preferences, habits, incomes are also considered to be constant.
3. Prices of prolific resources of a commodity and that of other related goods (substitute or complimentary) are known as well as constant.
4. Industry is easily availed with factors of production at a known and constant price compliant with the methods of production in use.
5. Prices of the products that the factor of production helps in producing and the price and quantity of other factors are known and constant.
6. There is perfect mobility of factors of production between occupation and places.

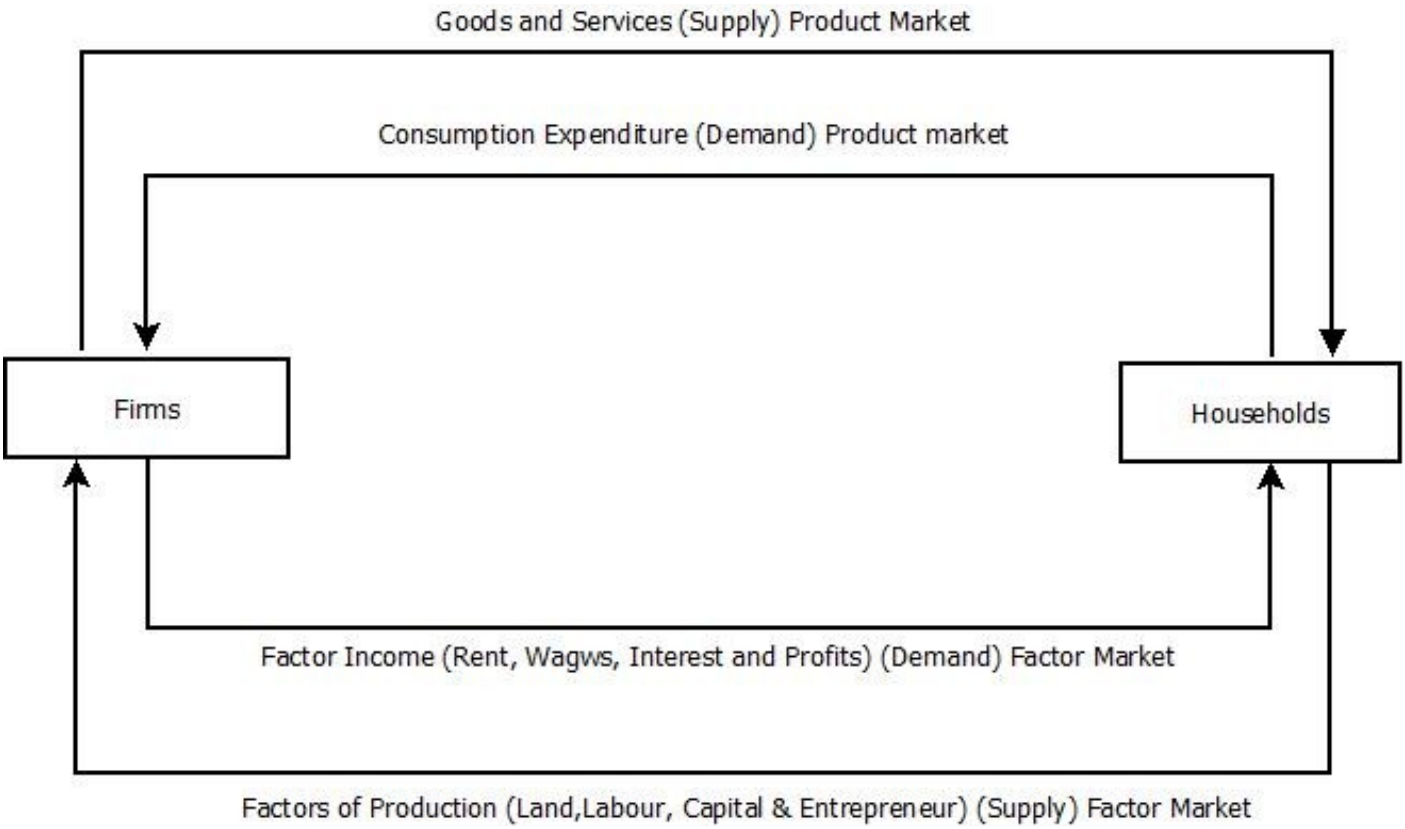
General Equilibrium

Leon Walras (1834-1910), a Neoclassical economist, in his book 'Elements of Pure Economics', created his theoretical and mathematical model of General Equilibrium as a means of integrating both the effects of demand and supply side forces in the whole economy.Elements of Pure Economics provides a succession of models, each taking into account more aspects of a real economy.General equilibrium theory is a branch of theoretical microeconomics.The partial equilibrium analysis studies the relationship between only selected few variables, keeping others unchanged.Whereas the general equilibrium analysis enables us to study the behaviour of economic variables taking full account of the interaction between those variables and the rest of the economy.In partial equilibrium analysis, the determination of the price of a good is simplified by just looking at the price of one good, and assuming that the prices of all other goods remain constant. Thus the economy is in general equilibrium when commodity prices make each demand equal to its supply and factor prices make the demand for each factor equal to its supply so that all product markets and factor markets are simultaneously in equilibrium.Such a general equilibrium is characterized by two conditions in which the set of prices in all product and factor markets is such that

1) All consumers maximize their satisfactions and all producers maximize their profits and

2) All markets are cleared which means that the total amount demanded equals the total amount supplied at a positive price in both the product and factor markets.

To explain it, we begin with a simple hypothetical economy where there are only two sectors, the household and the business. The economic activity takes the form of flow of goods and services between these two sectors and monetary flow between them. These two flows, called real and monetary are shown in figure.



Where the product market is show in the upper portion and the factor market in the lower portion. In the product market, consumers (Household) purchase goods and services from producers (Firms) while in the factor market, consumers receive income from the former for providing Factor services. The producers, in turn, make payments to consumers for the services rendered i.e. wage payments for labour services, interest for capital supplied, etc. thus payments go around in a circular manner from producers to consumers and from consumers to produces, as shown by arrows in the inner portion of the figure. There are also flows of goods and services in the opposite direction to the money payments flows. Goods flow from the business sector to the household sector in the product market, and services flow from the household sector to the business sector in the factor market, as shown in the outer portion of the figure. These two flows are linked by product prices and factor prices. The economy is in general equilibrium when a set of prices is allowed at which the magnitude of income flow from producers to consumers is equal to the magnitude of the money expenditure from consumers to producers.

b. Elaborate the properties of Isoquant curves?

The term Iso-quant or Iso-product is composed of two words, Iso = equal, quant = quantity or product = output. Thus it means equal quantity or equal product. Different factors are needed to produce a good. These factors may be substituted for one another. A given quantity of output may be produced with different combinations of factors. Iso-quant curves are also known as Equal-product or Iso-product or Production Indifference curves. Since it is an extension of Indifference curve analysis from the theory of consumption to the theory of production.

Thus, an Iso-product or Iso-quant curve is that curve which shows the different combinations of two factors yielding the same total product. Like, indifference curves, Iso- quant curves also slope downward from left to right. The slope of an Iso-quant curve expresses the marginal rate of technical substitution. "The Iso-product curves show the different combinations of two resources with which a firm can produce equal amount of product." **Bilas**

"Iso-product curve shows the different input combinations that will produce a given output." **Samuelson.** "An Iso-quant curve may be defined as a curve showing the possible combinations of two variable factors that can be used to produce the same total product." **Peterson**

Assumptions: The main assumptions of Iso-quant curves are as follows:

1. Two Factors of Production:

Only two factors are used to produce a commodity.

2. Divisible Factor:

Factors of production can be divided into small parts.

3. Constant Technique:

Technique of production is constant or is known before hand.

4. Possibility of Technical Substitution:

The substitution between the two factors is technically possible. That is, production function is of 'variable proportion' type rather than fixed proportion.

5. Efficient Combinations:

Under the given technique, factors of production can be used with maximum efficiency.

Iso-Product Schedule:

Let us suppose that there are two factor inputs—labour and capital. An Iso-product schedule shows the different combination of these two inputs that yield the same level of output as shown in table 1.

Table 1. Iso-Product Schedule.

Combination	Units of labour	Units of capital	Output of cloth (metres)
A	1	15	200
B	2	11	200
C	3	8	200
D	4	6	200
E	5	5	200

The table 1 shows that the five combinations of labour units and units of capital yield the same level of output, i.e., 200 metres of cloth. Thus, 200 metre cloth can be produced by combining.

(a) 1 units of labour and 15 units of capital (b) 2 units of labour and 11 units of capital

(c) 3 units of labour and 8 units of capital (d) 4 units of labour and 6 units of capital

(e) 5 units of labour and 5 units of capital

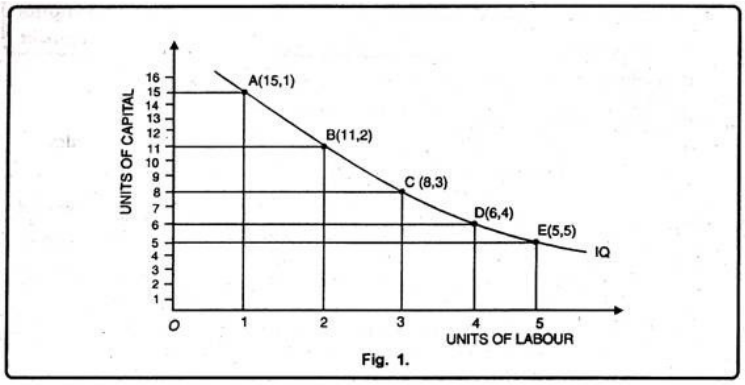


Fig. 1.

Iso-Product Curve:

From the above schedule iso-product curve can be drawn with the help of a diagram. An. equal product curve represents all those combinations of two inputs which are capable of producing the same level of output. The Fig. 1 shows the various combinations of labour and capital which give the same amount of output. A, B, C, D and E.

Iso-Product Map or Equal Product Map:

An Iso-product map shows a set of iso-product curves. They are just like contour lines which show the different levels of output. A higher iso-product curve represents a higher level of output. In Fig. 2 we have family iso-product curves, each representing a particular level of output.

The iso-product map looks like the indifference of consumer behaviour analysis. Each indifference curve represents particular level of satisfaction which cannot be quantified. A higher indifference curve represents a higher level of satisfaction but we cannot say by how much the satisfaction is more or less. Satisfaction or utility cannot be measured.

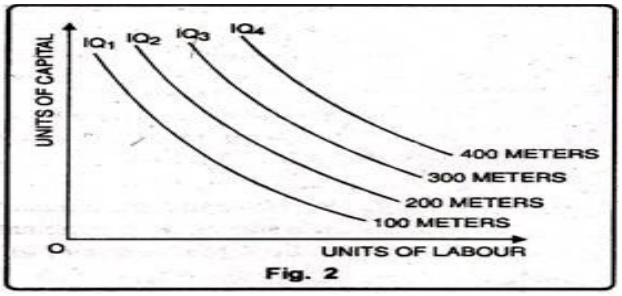


Fig. 2

An iso-product curve, on the other hand, represents a particular level of output. The level of output being a physical magnitude is measurable. We can therefore know the distance between two equal product curves. While indifference curves are labeled as IC_1, IC_2, IC_3, etc., the iso-product curves are labelled by the units of output they represent -100 metres, 200 metres, 300 metres of cloth and so on.

Properties of Iso-Product Curves:

1. Iso-Product Curves Slope Downward from Left to Right:

They slope downward because MTRS of labour for capital diminishes. When we increase labour, we have to decrease capital to produce a given level of output. This can be explained in the following diagram

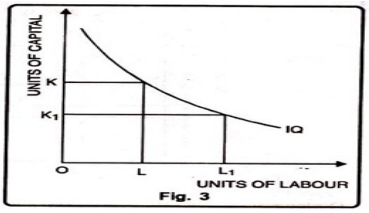


Fig. 3

The Fig. 3 shows that when the amount of labour is increased from OL to OL_1, the amount of capital has to be decreased from OK to OK_1, The iso-product curve (IQ) is falling as shown in the figure. **The possibilities of horizontal, vertical, upward sloping curves can be ruled out with the help of the following figure 4:**

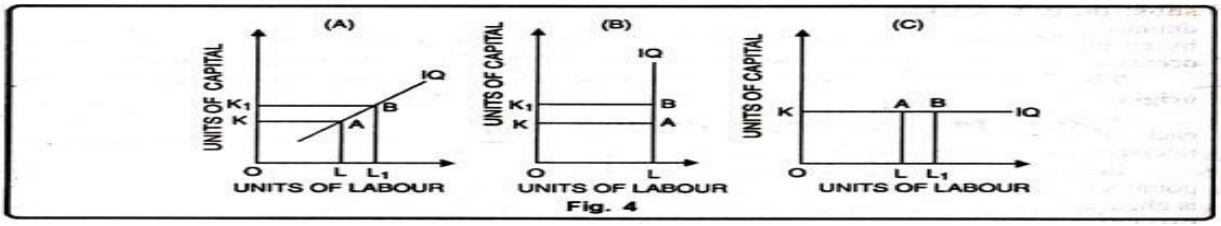


Fig. 4

(i) The figure (A) shows that the amounts of both the factors of production are increased-labour from L to Li and capital from K to K_1. When the amounts of both factors increase, the output must increase. Hence the IQ curve cannot slope upward from left to right.

(ii) The figure (B) shows that the amount of labour is kept constant while the amount of capital is increased. The amount of capital is increased from K to K_1. Then the output must increase. So IQ curve cannot be a vertical straight line.

(iii) The figure (C) shows a horizontal curve. If it is horizontal the quantity of labour increases, although the quantity of capital remains constant. When the amount of capital is increased, the level of output must increase. Thus, an IQ curve cannot be a horizontal line.

2. Isoquants are Convex to the Origin:

Like indifference curves, isoquants are convex to the origin. In order to understand this fact, we have to understand the concept of diminishing marginal rate of technical substitution (MRTS), because convexity of an isoquant implies that the MRTS diminishes along the isoquant. The marginal rate of technical substitution between L and K is defined as the quantity of K which can be given up in exchange for an additional unit of L. It can also be defined as the slope of an isoquant. **It can be expressed as:** $MRTS_{LK} = -\Delta K/\Delta L = dK/dL$

Where ΔK is the change in capital and AL is the change in labour. Equation (1) states that for an increase in the use of labour, fewer units of capital will be used. In other words, a declining MRTS refers to the falling marginal product of labour in relation to capital. To put it differently, as more units of labour are used, and as certain units of capital are given up, the marginal productivity of labour in relation to capital will decline.

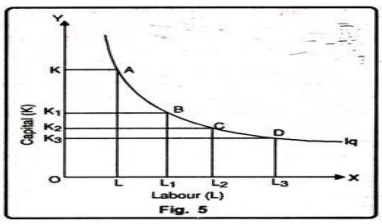


Fig. 5

This fact can be explained in Fig. 5. As we move from point A to B, from B to C and from C to D along an isoquant, the marginal rate of technical substitution (MRTS) of capital for labour diminishes. Everytime labour units are increasing by an equal amount (AL) but the corresponding decrease in the units of capital (AK) decreases. Thus it may be observed that due to falling MRTS, the isoquant is always convex to the origin.

3. Two Iso-Product Curves Never Cut Each Other:

As two indifference curves cannot cut each other, two iso-product curves cannot cut each other. In Fig. 6, two Iso-product curves intersect each other. Both curves IQ1 and IQ2 represent two levels of output. But they intersect each other at point A. Then combination A = B and combination A= C. Therefore B must be equal to C. This is absurd. B and C lie on two different iso-product curves. Therefore two curves which represent two levels of output cannot intersect each other.

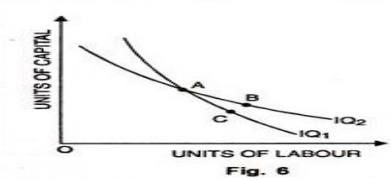


Fig. 6

4. Higher Iso-Product Curves Represent Higher Level of Output:

A higher iso-product curve represents a higher level of output as shown in the figure 7 given below:

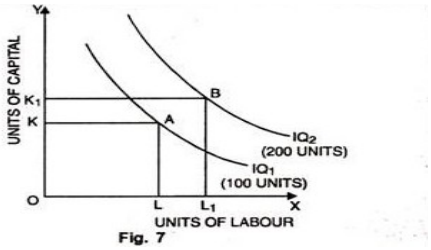


Fig. 7

In the Fig. 7, units of labour have been taken on OX axis while on OY, units of capital. IQ_1 represents an output level of 100 units whereas IQ2 represents 200 units of output.

5. Isoquants Need Not be Parallel to Each Other:

It so happens because the rate of substitution in different isoquant schedules need not be necessarily equal. Usually they are found different and, therefore, isoquants may not be parallel as shown in Fig. 8. We may note that the isoquants Iq_1 and Iq_2 are parallel but the isoquants Iq_3 and Iq4 are not parallel to each other.

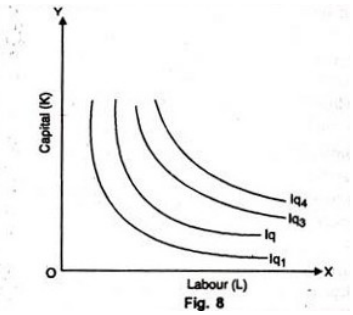


Fig. 8

6. No Isoquant can Touch Either Axis:

If an isoquant touches X-axis, it would mean that the product is being produced with the help of labour alone without using capital at all. These logical absurdities for OL units of labour alone are unable to produce anything. Similarly, OC units of capital alone cannot produce anything without the use of labour. Therefore as seen in figure 9, IQ and IQ_1 cannot be isoquants.

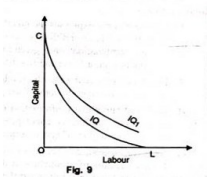


Fig. 9

7. Each Isoquant is Oval-Shaped.

It means that at some point it begins to recede from each axis. This shape is a consequence of the fact that if a producer uses more of capital or more of labour or more of both than is necessary, the total product will eventually decline. The firm will produce only in those segments of the isoquants which are convex to the origin and lie between the ridge lines. This is the economic region of production.

26. a Define the term supply and explain the Law of supply with suitable examples?

It is observed in markets that when more price of commodities are offered to sellers. They increase the quantity supplied of these commodities and when the level of prices decreases, the sellers decrease the quantity supplied. This behavior of seller is called law of supply.

Definition

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

There exists a direct and positive relationship between price and quantity supplied of a commodity. The functional relationship between quantity supplied and the price of a commodity can be expressed as:

$Q_s = f(P)$

Where Q_s = quantity supplied

P = price of commodity

Assumptions

The assumptions of the law of supply are as under:

No change in cost of production

It assumed that there is no change in cost of production because of the profit decreases with the increase in cost of production and it causes the decrease in supply. If price of a commodity decreases and cost of production also decreases, at the same time, the quantity supplied does not decrease and profit remains constant.

No change in technology

It is also assumed that technique of production does not change. If better methods of production are invented, profit increases at the previous price. The sellers increase supply and law of supply does not operate.

No change in climate

It is also assumed that there is no change in climatic situation. For example, at any place flood or earth quake occurred. The supply of goods decreases at that place at previously prevailing price.

No change in prices of substitutes

If the prices of substitutes of a commodity fall then the tendency of consumers diverts to substitutes therefore, the supply of a commodity falls without any change in price.

No change in natural resources

If the quantity of natural resources (minerals, gas, coal, oil etc) increases, the cost of production decreases. It causes to increase in quantity supplied.

No change in price of capital goods

The capital goods are raw material, machinery, tools etc. The cost of production increases due to increase in prices of capital goods. It can lead to decrease in quantity supplied.

No change in political situation

The amount of investment is affected by the change in political situation of a country. The production of goods decreases due to decrease in investment.

No change in tax policy

It is also assumed that the taxation policy of government does not change. The increase in taxes effects the investment and production and supply of goods decreases.

Explanation

The slope of the supply function i.e. $\Delta Q/\Delta P$ is positive. Regarding the assumptions, the standard supply function is written as $Q_s = - c + d P$

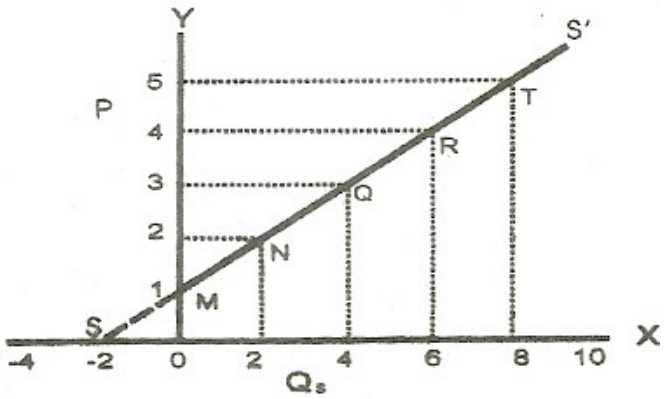
Where c and d are parameters while P and Q_s are independent and dependent variables, respectively. The positive sign represents direct relationship between P and Q_s.

The supply function is expressed with the help of following example: $Q_s = - 2 + 2 P$

By assuming different values of P, we can calculate the different values of Q_s as shown below.

Price (P)	Quantity supplied Q_s
0	-2
1	-0
2	2
3	4
4	6
5	8

As we assumed the different values of 'P' from zero to 5, then the calculated values of Qs increases from - 2 to 8.



The quantity supplied is expressed on X-axis while price is measured on Y-axis. The law of supply can be illustrated through the supply schedule as shown in the above supply curve SS'. By plotting the various combinations of price and quantity supplied, we get different points S, M, N, Q, R and T. by joining these points, we get our desired supply curve SS', having positive slope as shown in the above figure.

b. Describe the Theory of Consumer Behavior ?

Assumptions:

1. Rationality:

The consumer is assumed to be rational he aims at the maximization of his utility, given his income and market prices. It is assumed he has full knowledge (certainty) of all relevant information.

2. Utility is ordinal:

It is taken as axiomatically true that the consumer can rank his preferences (order the various 'baskets of goods') according to the satisfaction of each basket. He need not know precisely the amount of satisfaction. It suffices that he expresses his preference for the various bundles of commodities. It is not necessary to assume that utility is cardinally measurable. Only ordinal measurement is required.

3. Diminishing marginal rate of substitution:

Preferences are ranked in terms of indifference curves, which are assumed to be convex to the origin. This implies that the slope of the indifference curves increases. The slope of the indifference curve is called the marginal rate of substitution of the commodities. The indifference-curve theory is based, thus, on the axiom of diminishing marginal rate of substitution.

ADVERTISEMENTS:

4. The total utility of the consumer depends on the quantities of the commodities consumed

$U = f(q_1, q_2, \ldots, q_x, q_y, \ldots\ldots\ldots\ldots q_n)$

5. Consistency and transitivity of choice:

It is assumed that the consumer is consistent in his choice, that is, if in one period he chooses bundle A over B, he will not choose B over A in another period if both bundles are available to him.

The consistency assumption may be symbolically written as follows:

If A > B, then B !> A

Similarly, it is assumed that consumer's choices are characterised by transitivity: if bundle A is preferred to B, and B is preferred to C, then bundle A, is preferred to C.

Symbolically we may write the transitivity assumption as follows:

If A > B, and B > C, then A > C

Equilibrium of the consumer:

To define the equilibrium of the consumer (that is, his choice of the bundle that maximizes his utility) we must introduce the concept of indifference curves and of their slope (the marginal rate of substitution), and the concept of the budget line. These are the basic tools of the indifference curves approach.

Indifference curves:

An indifference curve is the locus of points – particular combinations or bundles of goods-which yield the same utility (level of satisfaction) to the consumer, so that he is indifferent as to the particular combination he consumes.

An indifference map shows all the indifference curves which rank the preferences of the consumer. Combinations of goods situated on an indifference curve yield the same utility. Combinations of goods lying on a higher indifference curve yield higher level of satisfaction and are preferred. Combinations of goods on a lower indifference curve yield a lower utility.

An indifference curve is shown in figure 2.5 and a partial indifference map is depicted in figure 2.6. It is assumed that the commodities y and x can substitute one another to a certain extent but are not perfect substitutes.

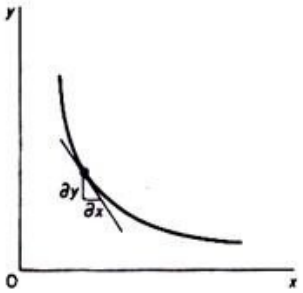


Figure 2.5

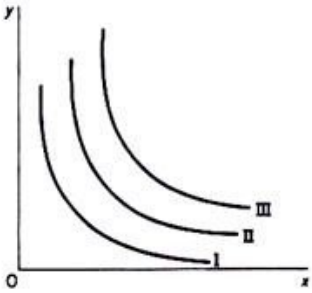


Figure 2.6

The negative of the slope of an indifference curve at any one point is called the marginal rate of substitution of the two commodities, x and y, and is given by the slope of the tangent at that point

[Slope of indifference curve] = – dy/dx = $MRS_{x,y}$

The marginal rate of substitution of x for y is defined as the number of units of commodity y that must be given up in exchange for an extra unit of commodity x so that the consumer maintains the same level of satisfaction. With this definition the proponents of the indifference-curves approach thought that they could avoid the non-operational concept of marginal utility.

In fact, what they avoid is the assumption of diminishing individual marginal utilities and the need for their measurement. The concept of marginal utility is implicit in the definition of the MRS, since it can be proved that the marginal rate of substitution (the slope of the indifference curve) is equal to the ratio of the marginal utilities of the commodities involved in the utility function

$MRS_{x,y} = MU_x / MU_y$ or $MRS_{y,x} = MU_y/Mu_x$

Furthermore, the indifference-curves theorists substitute the assumption of diminishing marginal utility with another which may also be questioned, namely the assumption that the indifference curves are convex to the origin, which implies diminishing MRS of the commodities.

Properties of the indifference curves:

1. An indifference curve has a negative slope, which denotes that if the quantity of one commodity (y) decreases, the quantity of the other (x) must increase, if the consumer is to stay on the same level of satisfaction.

2. The further away from the origin an indifference curve lies, the higher the level of utility it denotes bundles of goods on a higher indifference curve are preferred by the rational consumer.

3. Indifference curves do not intersect. If they did, the point of their intersection would imply two different levels of satisfaction, which is impossible.

Proof:

The slope of a curve at any one point is measured by the slope of the tangent at that point. The equation-of a tangent is given by the total derivative or total differential, which shows the total change of the function as all its determinants change.

The total utility function in the case of two commodities x and y is

$$U = f(x, y)$$

The equation of an indifference curve is

$$U = f(x, y) = k$$

where k is a constant. The total differential of the utility function is

$$dU = \frac{\partial U}{\partial y} dy + \frac{\partial U}{\partial x} dx = (MU_y)\, dy + (MU_x)\, dx$$

It shows the total change in utility as the quantities of both commodities change. The total change in U caused by changes in y and x is (approximately) equal to the change in y multiplied by its marginal utility, plus the change in x multiplied by its marginal utility.

Along any particular indifference curve the total differential is by definition equal to zero. Thus for any indifference curve

$$dU = (MU_y)\,dy + (MU_x)\,dx = 0$$

Rearranging we obtain

$$\text{either} \quad -\frac{dy}{dx} = \frac{MU_x}{MU_y} = MRS_{x,y} \quad \text{or} \quad -\frac{dx}{dy} = \frac{MU_y}{MU_x} = MRS_{y,x}$$

4. The indifference curves are convex to the origin. This implies that the slope of an indifference curve decreases (in absolute terms) as we move along the curve from the left downwards to the right: the marginal rate of substitution of the commodities is diminishing. This axiom is derived from introspection, like the 'law of diminishing marginal utility' of the cardinalist school.

The axiom of decreasing marginal rate of substitution expresses the observed behavioural rule that the number of units of x the consumer is willing to sacrifice in order to obtain an additional unit of y increases as the quantity of y decreases. It becomes increasingly difficult to substitute x for y as we move along the indifference curve. In figure 2.9 the fifth unit of y can be substituted for x by the consumer giving up x_1x_2 of x; but to substitute the second unit of y and still retain the same satisfaction the consumer must give up a much greater quantity of x, namely x_3 x_4.

Register No.: …….
[17BAU201]

KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University)
(Established Under Section 3 of UGC Act, 1956)
COIMBATORE – 641 021
Second Internal Examination, February - 2018
I BBA – II Semester

MANAGERIAL ECONOMICS – Answer Key
PART – A

1. Average
2. Marginal
3. Price discriminator
4. P = AR = MR = AC = MC
5. Aggressive Advertising by individual firms
6. Is upward sloping
7. short
8. monopolist
9. inputs
10. production
11. Depreciation
12. Capital formation
13. Organization
14. scale
15. monopolist
16. MR = MC
17. Total
18. Downward
19. individual
20. Individual

PART – B

21. Define the term Oligopoly?

An **oligopoly** is an economic market whereby a small number of companies or countries generate and control the entire supply of a good or service.

In simple words, "Oligopoly is a situation in which there are so few sellers that each of them is conscious of the results upon the price of the supply which he individually places upon the market"-The number of sellers is greater than one, yet not big enough to render negligible the influence of any one upon the market price.

"Oligopoly is that situation in which a firm bases its markets policy in part on the expected behaviour of a few close rivals." – J. Stigier

"An oligopoly is a market of only a few sellers, offering either homogeneous or differentiated products. There are so few sellers that they recognize their mutual dependence." – PC. Dooley

22. Write any two difference between Short - run cost and Long – run cost?

The main **difference between long run** and **short run costs** is that there are no fixed factors **in the long run**; there are both fixed and variable factors **in the short run**. **In the long run** the general price level, contractual wages, and expectations adjust fully to the state **of the** economy.

23. List out the different types of price discrimination?

First-Degree Discrimination: Considering Individual Customers

Second-Degree Discrimination: Allowing Customers to Choose a Deal

Third-Degree Discrimination: Special Prices for Special Groups

PART – C

24. a. Enumerate the classification of market structure under various fields?

1. Perfect Competition:

In perfect competition there is a very large number of firms in the industry and the product is homogeneous. Competition is perfect in the sense that every firm considers that it can sell any amount of output it wishes at the going market price, which cannot be affected by the individual producer whose share in the market is very small. Thus although competition is perfect, there is no rivalry among the individual firms. Each one firm acts atomistically, that is, it decides its level of output ignoring the others in the industry. The products of the firms are perfect substitutes for one another so that the price-elasticity of the demand curve of the individual firm is infinite. Entry is free and easy.

2. Monopoly:

In a monopoly situation there is only one firm in the industry and there are no close substitutes for the product of the monopolist. The demand of the monopolist coincides with the industry demand, which has a finite price elasticity. Entry is blockaded.

3. Monopolistic Competition:

In a market of monopolistic competition there is a very large number of firms, but their product is somewhat differentiated. Hence the demand of the individual firm has a negative slope, but its price elasticity is high due to the existence of the close substitutes produced by the other firms in the industry. Despite the existence of close substitutes each firm acts

atomistically, ignoring the competitors' reactions, because there are too many of them and each one would be very little affected by the actions of any other competitor.

4. Oligopoly:

In an oligopolistic market there is a small number of firms, so that sellers are conscious of their interdependence. Thus each firm must take into account the rivals' reactions. The competition is not perfect, yet the rivalry among firms is high, unless they make a collusive agreement. The products that the oligopolists produce may be homogeneous (pure oligopoly) or differentiated (differentiated oligopoly).

b. Describe the features and significance of perfect competition?

A Perfect Competition market is that type of market in which the number of buyers and sellers is very large, all are engaged in buying and selling a homogeneous product without any artificial restrictions and possessing perfect knowledge of the market at a time.

In other words it can be said—"A market is said to be perfect when all the potential buyers and sellers are promptly aware of the prices at which the transaction take place. Under such conditions the price of the commodity will tend to be equal everywhere."

In this connection Mrs. Joan Robinson has said**—"Perfect Competition prevails when the demand for the output of each producer is perfectly elastic."**

According to Boulding—"A Perfect Competition market may be defined as a large number of buyers and sellers all engaged in the purchase and sale of identically similar commodities, who are in close contact with one another and who buy and sell freely among themselves."

Characteristics of Perfect Competition:

The following characteristics are essential for the existence of Perfect Competition:

1. Large Number of Buyers and Sellers:

The first condition is that the number of buyers and sellers must be so large that none of them individually is in a position to influence the price and output of the industry as a whole. In the market the position of a purchaser or a seller is just like a drop of water in an ocean.

2. Homogeneity of the Product:

Each firm should produce and sell a homogeneous product so that no buyer has any preference for the product of any individual seller over others. If goods will be homogeneous then price will also be uniform everywhere.

3. Free Entry and Exit of Firms:

The firm should be free to enter or leave the firm. If there is hope of profit the firm will enter in business and if there is profitability of loss, the firm will leave the business.

4. Perfect Knowledge of the Market:

Buyers and sellers must possess complete knowledge about the prices at which goods are being bought and sold and of the prices at which others are prepared to buy and sell. This will help in having uniformity in prices.

5. Perfect Mobility of the Factors of Production and Goods:

There should be perfect mobility of goods and factors between industries. Goods should be free to move to those places where they can fetch the highest price.

6. Absence of Price Control:

There should be complete openness in buying and selling of goods. Here prices are liable to change freely in response to demand and supply conditions.

7. Perfect Competition among Buyers and Sellers:

In this purchasers and sellers have got complete freedom for bargaining, no restrictions in charging more or demanding less, competition feeling must be present there.

8. Absence of Transport Cost:

There must be absence of transport cost. In having less or negligible transport cost will help complete market in maintaining uniformity in price.

9. One Price of the Commodity:

There is always one price of the commodity available in the market.

10. Independent Relationship between Buyers and Sellers:

There should not be any attachment between sellers and purchasers in the market. Here, the seller should not show prick and choose method in accepting the price of the commodity. If we will see from the close we will find that in real life **"Perfect Competition is a pure myth."**

25. a. Determine relationship between Cost, Revenue and Output through Optimisation?

In economics, **profit maximization** is the short run or long run process by which a firm may determine the price, input, and output levels that lead to the greatest profit. Neoclassical economics, currently the mainstream approach to microeconomics, usually models the firm as maximizing profit.

There are several perspectives one can take on this problem. First, since profit equals revenue minus cost, one can plot graphically each of the variables revenue and cost as functions of the level of output and find the output level that maximizes the difference (or this can be done with a table of values instead of a graph). Second, if specific functional forms are known for revenue and cost in terms of output, one can use calculus to maximize profit with respect to the output level. Third, since the first order condition for the optimization equates marginal revenue and marginal cost, if marginal revenue and marginal cost functions in terms of output are directly available one can equate these, using either equations or a graph.

Fourth, rather than a function giving the cost of producing each potential output level, the firm may have input cost functions giving the cost of acquiring any amount of each input, along with a production function showing how much output results from using any combination of input quantities. In this case one can use calculus to maximize profit with respect to input usage levels, subject to the input cost functions and the production function. The first order condition for each input equates the marginal revenue product of the input (the increment to revenue from selling the product caused by an increment to the amount of the input used) to the marginal cost of the input.

The principal difference between short-run and long-run profit maximization is that in the long run the quantities of all inputs, including physical capital, are choice variables, while in the short run the amount of capital is predetermined by past investment decisions. In either case there are inputs of labor and raw materials.

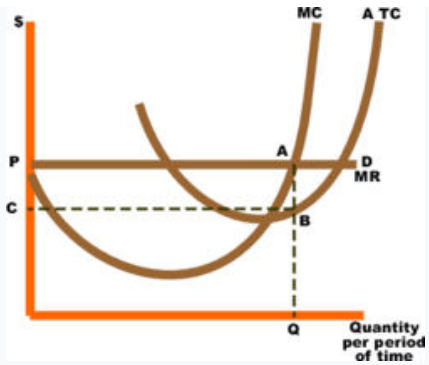
Total revenue–total cost perspective

Profit maximization using the total revenue and total cost curves of a perfect competitor To obtain the profit maximizing output quantity, we start by recognizing that profit is equal to total revenue (TR) minus total cost (TC). Given a table of costs and revenues at each quantity, we can either compute equations or plot the data directly on a graph. The profit-maximizing output is the one at which this difference reaches its maximum.

In the accompanying diagram, the linear total revenue curve represents the case in which the firm is a perfect competitor in the goods market, and thus cannot set its own selling price. The profit-maximizing output level is represented as the one at which total revenue is the height of C and total cost is the height of B; the maximal profit is measured as the length of the segment CB. This output level is also the one at which the total profit curve is at its maximum.

If, contrary to what is assumed in the graph, the firm is not a perfect competitor in the output market, the price to sell the product at can be read off the demand curve at the firm's optimal quantity of output.

Marginal revenue–marginal cost perspective



Profit maximization using the marginal revenue and marginal cost curves of a perfect competitor

An equivalent perspective relies on the relationship that, for each unit sold, marginal profit ($M\pi$) equals marginal revenue (MR) minus marginal cost (MC). Then, if marginal revenue is greater than marginal cost at some level of output, marginal profit is positive and thus a greater quantity should be produced, and if marginal revenue is less than marginal cost, marginal profit is negative and a lesser quantity should be produced. At the output level at which marginal revenue equals marginal cost, marginal profit is zero and this quantity is the one that maximizes profit. Since total profit increases when marginal profit is positive and total profit decreases when marginal profit is negative, it must reach a maximum where marginal profit is zero—where marginal cost equals marginal revenue—and where lower or higher output levels give lower profit levels. In calculus terms, the requirement that the optimal output have higher profit than adjacent output levels is that:

b. Explain the various classifications of Market and its price determination?

In simple terms, market refers to a physical place where goods and services are exchanged between buyers and sellers at a particular price.

However, in economic sense, market does not require a physical location or personal contact between buyers and sellers for the transaction of a product.

"Economists understand the term market not any particular marketplace in which things are bought and sold but the whole of any region in which buyers and sellers are in such free intercourse with one another that the price of the same goods tends to equality easily and quickly" – Cournot.

In economics, market is defined as a set of buyers and sellers who are geographically separated from each other, but are still able to communicate to finalize the transaction of a product. The market for a product can be local, regional, national, or international.

A market can have a number of interconnected characteristics, including level of competition, number of sellers and buyers, type of products, and barriers to entry and exit. These interlinked characteristics are combined to form a market structure. Among various characteristics of a market, the level and nature of competition contribute a significant part in the classification of market structure.

Depending on the degree and type of competition, market structures can be grouped into three main categories, namely, purely competitive market, perfectly competitive market, and imperfectly competitive market. A purely competitive market is one which is characterized by a large number of independent sellers and buyers dealing in standardized products.

A perfectly competitive market is a wider term than a purely competitive market. In a perfectly competitive market, a large number of buyers and sellers are involved in the transaction of

homogenous products. In this type of market, buyers and sellers are fully aware about the prices of products.

Therefore, the market price of a product is fixed in a perfectly competitive market. However, this type of market structure cannot exist in the real world. On the other hand, an imperfectly competitive market is defined as a market in which buyers and sellers deal in differentiated products. Moreover, in an imperfectly competitive market, sellers have the power of influencing the market price of products.

Classification of Market:

Market refers to a system under which buyers and sellers negotiate the price of a product, settle the price, and transact their business. The buyers and sellers behave differently in different markets and influence the prices of products. Therefore, markets need to be classified on the basis of various factors.

Some of factors are as follows:

i. Size:

Refers to an important basis of classification of market. The size of market varies according to the type of product.

Along with the product, there are some other factors that affect the size of market, which are as follows:

a. Type of Product:

Helps in determining the size of a market. A product that has high portability' and durability and whose supply varies with time, then the market size of that product would be large. For example, market size of wheat, petroleum, and coal. On the other hand, perishable products, such as fruits and vegetables, have narrow markets.

b. Demand:

Constitutes a significant factor for determining market size. A product whose demand is high would have a large market size due to a large number of buyers. On the other hand, a product that has less demand would have a small market size, as only few buyers are willing to buy it.

c. Mobility of Products:

Affects the market size to a large extent. Generally, a product that can be easily transported to different regions has a large market size. For example, products, such as food grains and clothes, are easily transportable. On the contrary, fast moving consumer goods (FMCG), such as eatables and flowers, are difficult to be transferred due to short life span. Therefore, these products have a small market size.

d. Peace and Security:

Refers to the type of political, social and economic environment of a country or region. The regions or countries that are not considered as peaceful places do not attract organizations to establish or market their products. Therefore, the market size of products is restricted in the regions where security is limited.

e. Currency and Credit System:

Influences the size of a market to a greater extent. A well-developed currency and credit system of a country helps organizations to flourish and expand more, which plays a very important role in increasing the market size of a product.

f. State Policy:

Plays an important role in increasing or decreasing the market size of a product. If the state policy supports and encourage the expansion of a product, it would result in increase in the size of the market. For example, eco-friendly products are encouraged by government. On the other hand, products that are restricted according to the state policy would lose the market size, such as tobacco and alcohol.

ii. Competition:

Refers to the most important basis of classification of market. On the basis of competition, markets are classified as perfect market and imperfect market. In a perfect market, buyers and sellers are fully aware about the prices of products prevailing in the market.

Therefore, the price of a product is same all over the market. On the other hand, in an imperfect market, the price of a product is different all over the market as buyers and sellers do not have any information regarding prices of products.

26. a. Determine the basic features, demand and cost in Monopolistic Competition situation?

1. Large Number of Buyers and Sellers:

There are large number of firms but not as large as under perfect competition.

That means each firm can control its price-output policy to some extent. It is assumed that any price-output policy of a firm will not get reaction from other firms that means each firm follows the independent price policy.

If a firm reduces its price, the gains in sales will be slightly spread over many of its rivals so that the extent to which each of the rival firms suffers will be very small. Thus these rival firms will have no reason to react.

2. Free Entry and Exit of Firms:

Like perfect competition, under monopolistic competition also, the firms can enter or exit freely. The firms will enter when the existing firms are making super-normal profits. With the entry of new firms, the supply would increase which would reduce the price and hence the existing firms will be left only with normal profits. Similarly, if the existing firms are sustaining losses, some of the marginal firms will exit. It will reduce the supply due to which price would rise and the existing firms will be left only with normal profit.

3. Product Differentiation:

Another feature of the monopolistic competition is the product differentiation. Product differentiation refers to a situation when the buyers of the product differentiate the product with other. Basically, the products of different firms are not altogether different; they are slightly different from others. Although each firm producing differentiated product has the monopoly of its own product, yet he has to face the competition. This product differentiation may be real or imaginary. Real differences are like design, material used, skill etc. whereas imaginary differences are through advertising, trade mark and so on.

4. Selling Cost:

Another feature of the monopolistic competition is that every firm tries to promote its product by different types of expenditures. Advertisement is the most important constituent of the selling cost which affects demand as well as cost of the product. The main purpose of the monopolist is to earn maximum profits; therefore, he adjusts this type of expenditure accordingly.

5. Lack of Perfect Knowledge:

The buyers and sellers do not have perfect knowledge of the market. There are innumerable products each being a close substitute of the other. The buyers do not know about all these products, their qualities and prices.

Therefore, so many buyers purchase a product out of a few varieties which are offered for sale near the home. Sometimes a buyer knows about a particular commodity where it is available at low price. But he is unable to go there due to lack of time or he is too lethargic to go or he is unable to find proper conveyance. Likewise, the seller does not know the exact preference of buyers and is, therefore, unable to get advantage out of the situation.

6. Less Mobility:

Under monopolistic competition both the factors of production as well as goods and services are not perfectly mobile.

7. More Elastic Demand:

Under monopolistic competition, demand curve is more elastic. In order to sell more, the firms must reduce its price.

b. Explain the Pricing under Oligopoly of Kinked Demand Curve Model?

In this article we will discuss about:- 1. Assumptions of the Kinked Demand Curve Model 2. Why the Kink in the Demand Curve? 3. Analysis of the Kinked Demand Curve Model.

Assumptions of the Kinked Demand Curve Model:

This model was developed independently by Prof. Paul M. Sweezy on the one hand and Profs. R. C. Hall and C. J. Hitch on the other hand.

The assumptions of this model are:

(i) There are only a few firms in an oligopolistic market.

(ii) The firms are producing close-substitute products.

(iii) The quality of the products remains constant and the firms do not spend on advertising.

(iv) A set of prices of the product has already been determined and these prices prevail in the market at present.

(v) Each firm believes that if it reduces the price of its product, the rival firms would follow suit, but if it increases the price, then the rivals would not follow it, they would simply keep their prices unchanged. We shall see presently that, because of this asymmetric reaction pattern of the rivals, the demand curve of each firm would have a kink at the prevailing price of its product.

Why the Kink in the Demand Curve?

In Fig. 14.18 we have drawn two negatively sloped straight line demand curves, viz., dd' and DD'. Of these two curves, dd' is more flat than DD'. Now, when one particular firm in the industry changes the price of its product, all other firms keeping their prices constant, the firm's demand curve will be relatively flatter like dd', i.e., the magnitude of the change in the demand for its product as its price changes would be relatively larger.

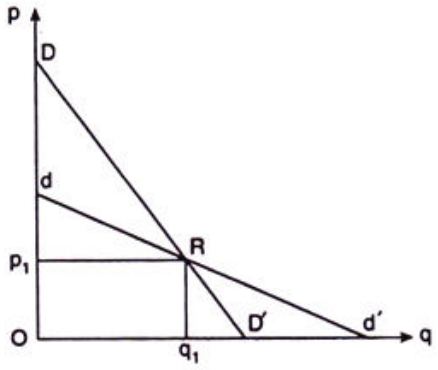


Fig. 14.18 Explaining the kink in the demand curve

This is because, as the firm reduces or increases the price of its product, the prices of the products of other firms remaining constant, the product of the firm becomes relatively cheaper or dearer, respectively, than those of the other firms.

On the other hand, if a particular firm in the industry changes the price of its product, and following this, all other firms also change their prices in the same direction, and, say by the same

proportion, for the sake of simplicity, then the firm's demand curve would be relatively more steep like DD'.

This is because, in this case, as the firm decreases or increases the price, its product does not become neither relatively cheaper nor dearer. Therefore, now its demand curve would be less elastic, or more steep, than dd'—now the demand curve would be like DD'.

Let us suppose that initially the price of the product of the firm is p_1 or Op_1 and the demand for the product is q_1 or Oq_1 If the firm now increases its price from p_1, the rival firms would keep their prices unchanged according to assumption (v) of this model.

In this case, the firm's demand would decrease along the segment Rd of the relatively more elastic demand curve dd'. On the other hand, if it goes on decreasing its price from p_1, its rivals also would be decreasing their prices according to assumption (v). In this case, the quantity demanded of the firm's product will increase along the segment RD' of the relatively steeper demand curve DD'.

Therefore, at the price p_1, the firm's demand curve would be dRD'. Obviously, because of assumption (v), the segment dR of this demand curve would be more flat or more elastic than the segment RD' (and the segment RD' would be more steep or less elastic than the segment dR).

However, it is not that the firm's goal of profit maximisation can never be achieved because of the existence of this vertical gap. Even when the firm's demand increases, i.e., its demand curve shifts to the right and/or its MC curve shifts upwards, it is not impossible for it to achieve profit maximisation at the prevailing price. Therefore, although the kinked demand curve model cannot explain the process of price determination, it can well explain why the prices are sticky in an oligopolistic market.