KARPAGAM ACADEMY OF HIGHER EDUCATION

COURSE: III BCOM PA **SUBJECT: MICRO ECONOMICS**

SUBJECTCODE: 17PAU504 B **BATCH :2017-2020**

UNIT –I

Demand and Consumer Behaviour

1. Market demands or demand curves are explained as stemming from the process of individuals' choosing their most preferred bundle of consumption goods and services.
2. Economists explain consumer demand by the concept of utility, which denotes the relative satisfaction that a consumer obtains from using different commodities. The additional satisfaction obtained from consuming an additional unit of a good is given the name *marginal utility*, where "marginal" means the extra or incremental utility. The law of diminishing marginal utility states that as the amount of a commodity consumed increases, the marginal utility of the last unit consumed tends to decrease.
3. Economists assume that consumers allocate their limited incomes so as to obtain the greatest satisfaction or utility. To maximize utility, a consumer must satisfy the *equimarginal principle* that the marginal utilities of the last dollar spent on each and every good must be equal.
   Only when the marginal utility per dollar is equal for apples, bacon, coffee, and everything else will the consumer attain the greatest satisfaction from a limited dollar income. But be careful to note that the marginal utility of a $50-per-ounce bottle of perfume is not equal to the marginal utility of a 50-cent glass of cola. Rather, their marginal utilities divided by price per unit are all equal in the consumer's optimal allocation. That is, their marginal utilities per last dollar, *MU/P*, are equalized.
4. Equal marginal utility or benefit per unit of resource is a fundamental rule of choice. Take any scarce resource, such as time. If you want to maximize the value or utility of that resource, make sure that the marginal benefit per unit of the resource is equalized in all uses.

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5. The market demand curve for all consumers is derived by adding horizontally the separate demand curves of each consumer. A demand curve can shift for many reasons. For example, a rise in income will normally shift *DD* rightward, thus increasing demand; a rise in the price of a substitute good (e.g., chicken for beef) will also create a similar upward shift in demand; a rise in the price of a complementary good (e.g., hamburger buns for beef) will in turn cause the *DD* curve to shift downward and leftward. Still other factors—changing tastes, population, or expectations—can affect demand.
6. We can gain added insight into the factors that cause downward-sloping demand by separating the effect of a price rise into substitution and income effects. (*a*) The substitution effect occurs when a higher price leads to substitution of other goods to meet satisfactions; (*b*) the income effect means that a price increase lowers real income and thereby reduces the desired consumption of most commodities. For most goods, substitution and income effects of a price increase reinforce one another and lead to the law of downward-sloping demand. We measure the quantitative responsiveness of demand to income by the income elasticity, which is the percentage change in quantity demanded divided by the percentage change in income.
7. Remember that it is the tail of marginal utility that wags the market dog of prices. This point is emphasized by the concept of *consumer surplus.* We pay the same price for the last quart of milk as for the first. But, because of the law of diminishing marginal utility, marginal utilities of earlier units are greater than that of the last unit. This means that we would have been willing to pay more than the market price for each of the earlier units. The excess of total value over market value is called consumer surplus. Consumer surplus reflects the benefit we gain from being able to buy all units at the same low price. In simplified cases, we can measure consumer surplus as the area between the demand curve and the price line. It is a concept relevant for many public decisions—such as deciding when the community should incur the heavy expenses of a road or bridge or set aside land for a wilderness area.

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Meaning of Revenue:

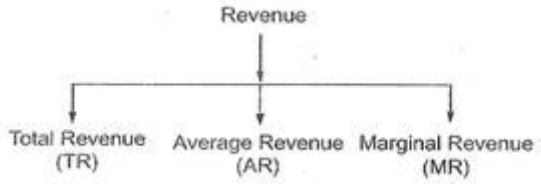
The amount of money that a producer receives in exchange for the sale proceeds is known as revenue. For example, if a firm gets Rs. 16,000 from sale of 100 chairs, then the amount of Rs. 16,000 is known as revenue.

Revenue refers to the amount received by a firm from the sale of a given quantity of a commodity in the market.

Revenue is a very important concept in economic analysis. It is directly influenced by sales level, i.e., as sales increases, revenue also increases.

Concept of Revenue:

The concept of revenue consists of three important terms; Total Revenue, Average Revenue and Marginal Revenue.



Total Revenue (TR):

Total Revenue refers to total receipts from the sale of a given quantity of a commodity. It is the total income of a firm. Total revenue is obtained by multiplying the quantity of the commodity sold with the price of the commodity.

Total Revenue = Quantity × Price

For example, if a firm sells 10 chairs at a price of Rs. 160 per chair, then the total revenue will be: 10 Chairs × Rs. 160 = Rs 1,600

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Average Revenue (AR):

Average revenue refers to revenue per unit of output sold. It is obtained by dividing the total revenue by the number of units sold.

Average Revenue = Total Revenue/Quantity

For example, if total revenue from the sale of 10 chairs @ Rs. 160 per chair is Rs. 1,600, then:

Average Revenue = Total Revenue/Quantity = 1,600/10 = Rs 160

AR and Price are the Same:

We know, AR is equal to per unit sale receipts and price is always per unit. Since sellers receive revenue according to price, price and AR are one and the same thing.

This can be explained as under:

TR = Quantity × Price … (1)

AR = TR/Quantity …… (2)

Putting the value of TR from equation (1) in equation (2), we get

AR = Quantity × Price / Quantity

AR = Price

AR Curve and Demand Curve are the Same:

A buyer's demand curve graphically represents the quantities demanded by a buyer at various prices. In other words, it shows the various levels of average revenue at which different quantities of the good are sold by the seller. Therefore, in economics, it is customary to refer AR curve as the Demand Curve of a firm.

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Marginal Revenue (MR):

Marginal revenue is the additional revenue generated from the sale of an additional unit of output. It is the change in TR from sale of one more unit of a commodity.

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

Where:

MR_n = Marginal revenue of nth unit;

TR_n = Total revenue from n units;

TR_{n-1} = Total revenue from (n – 1) units; n = number of units sold For example, if the total revenue realised from sale of 10 chairs is Rs. 1,600 and that from sale of 11 chairs is Rs. 1,780, then MR of the 11th chair will be:

$MR_{11} = TR_{11} – TR_{10}$

MR_{11} = Rs. 1,780 – Rs. 1,600 = Rs. 180

One More way to Calculate MR:

We know, MR is the change in TR when one more unit is sold. However, when change in units sold is more than one, then MR can also be calculated as:

MR = Change in Total Revenue/ Change in number of units = $\Delta TR/\Delta Q$

Let us understand this with the help of an example: If the total revenue realised from sale of 10 chairs is Rs. 1,600 and that from sale of 14 chairs is Rs. 2,200, then the marginal revenue will be:

MR = TR of 14 chairs – TR of 10 chairs / 14 chairs -10 chairs = 600/4 = Rs. 150

TR is summation of MR:

Total Revenue can also be calculated as the sum of marginal revenues of all the units sold.

It means, $TR_n = MR_1 + M_2 + MR_3 + \ldots\ldots\ldots MR_n$

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or, TR = ∑MR

The concepts of TR, AR and MR can be better explained through Table 7.1.

Table 7.1: TR, AR and MR:

Units Sold (Q)	Price (Rs.) (P)	Total Revenue (Rs.) TR = Q x P	Average Revenue (Rs.) AR = TR+Q = P	Marginal Revenue (Rs.) $MR_n=TR_n-TR_{n-1}$
1	10	10=1×10	10 =10 + 1	10 =10-0
2	9	18 =2×9	9 =18 + 2	8 =18-10
3	8	24 =3×8	8 =24 + 3	6 =24-18
4	7	28 = 4×7	7 =28 + 4	4 =28-24
5	6	30 = 5×6	6 =30 + 5	2 =30-28
6	5	30 = 6 x 5	5 =30 + 6	0 =30-30
7	4	28 = 7×4	4 =28 + 7	-2 =28-30

Difference between Perfect Competition and Imperfect Competition

Based on competition, the market structure has been classified into two broad categories like Perfectly competitive and Imperfectly competitive. **Perfect Competition** is not found in the real world market because it is based on many assumptions. But an **Imperfect Competition** is associated with a practical approach

The type of market structure decides the market share of a firm in the market. If there exists a single firm, it will serve the entire market, and the demand of the customers are satisfied with that firm only. But if we increase the number of firms to two, the market will also be shared by the two. Similarly, if there are about 100 small firms in the market, the market is shared by all of them in proportion.

Therefore, it is the market structure, which affects the market. So here we are going to describe the differences between perfect competition and imperfect competition, in economics.

Content: Perfect Competition Vs Imperfect Competition

Comparison Chart

BASIS FOR COMPARISON	PERFECT COMPETITION	IMPERFECT COMPETITION
Meaning	Perfect Competition is a type of	Imperfect Competition is an

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BASIS FOR COMPARISON	PERFECT COMPETITION	IMPERFECT COMPETITION
	competitive market where there are numerous sellers selling homogeneous products or services to numerous buyers.	economic structure, which does not fulfill the conditions of the perfect competition.
Nature of concept	Theoretical	Practical
Product Differentiation	None	Slight to Substantial
Players	Many	Few to many
Restricted entry	No	Yes
Firms are	Price Takers	Price Makers

Definition of Perfect Competition

Perfect Competition is an economic structure where the degree of competition between the firm is at its peak. Given are the salient features of the perfect competition:

- Many buyers and sellers.
- Product offered is identical in all respects.

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- Any firm can come and go, as per its own discretion.
- Both the parties to the transaction are having complete knowledge about the product, quantity, price, market and market conditions as well.
- Transportation and Advertising cost is nil.
- Free from government interference.
- The price for a product is uniform across the market. It decided by the demand and supply forces; no firm can affect the prices, that's why the firms are price takers.
- Each firm earns a normal profit.

Example: Suppose you go to a vegetable market to buy tomatoes. There are many tomato vendors and buyers. You go to a vendor and inquire about the cost of 1 kg tomatoes, the vendor replies, it will cost Rs. 10. Then you go ahead and inquire some more vendors. The prices of all the vendors are same for the demanded quantity. This is an example of perfect competition.

Definition of Imperfect Competition

The competition, which does not satisfy one or the other condition, attached to the perfect competition is imperfect competition. Under this type of competition, the firms can easily influence the price of a product in the market and reap surplus profits.

In the real world, it is hard to find perfect competition in any industry, but there are so many industries like **telecommunications, automobiles, soaps, cosmetics, detergents, cold drinks and technology, where you can find imperfect competition**. By the virtue of this, imperfect competition is also considered as real world competition.

There are various forms of imperfect competition, described below:

- **Monopoly**: Single seller dominates the entire market.
- **Duopoly**: Two sellers share the whole market.

- **Oligopoly**: Few sellers are there who either act in collusion or competition.
- **Monopsony**: Many sellers and a single buyer.
- **Oligopsony**: Many sellers and few buyers.
- **Monopolistic Competition**: Numerous sellers offering unique products.

Key Differences Between Perfect Competition and Imperfect Competition

The main points of difference between perfect competition and imperfect competition in economics are depicted below:

1. The competitive market, in which there are a large number of buyers and sellers, and the sellers supply identical products to the buyers; it is known as perfect competition. Imperfect competition occurs when one or more conditions of the perfect competition are not met.
2. Perfect competition is a hypothetical situation, which does not apply in the real world. Conversely, Imperfect Competition is a situation that is found in the present day world.
3. In perfect competition, there are many players in the market, but in imperfect competition, there can be few to many players, depending upon the type of market structure.
4. In perfect competition, the sellers produce or supply identical products while in imperfect competition the products offered by the sellers can either be homogeneous or differentiated.
5. In perfect competition, there are no barriers to the entry and exit of the firms which is just opposite in the case of imperfect competition.
6. In perfect competition, it is assumed that the firms do not influence the price of a product. Hence they are price takers but in imperfect competition, the firms are price makers.

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Conclusion

Perfect competition is an imaginary situation which does not exist in reality, but imperfect competition is factual i.e. which genuinely exist.

Whichever market, you consider for this like for example if you consider the detergent market. There are many players like Tide, Rin, Surf Excel, Ariel, Ghadi, etc. producing similar product i.e. detergent.

At first instance, you may think that this is an example of perfect competition, but this is not so. If you dig a little deeper, you may find that all the products are different as well as they vary in their prices. Some are low budget detergents for capturing the market of price sensitive people while others are high budget detergents for quality sensitive people.

Elasticity of Demand

Perfectly Elastic and Perfectly Inelastic

To begin the conversation about relative elasticity, it helps to first look at the extremes.

Perfectly Elastic

Imagine a product where if the price increased, even slightly, you wouldn't buy any it anymore. Sound familiar? That's because we introduced this concept in Topic 3, as one of the assumptions of a perfectly competitive market. One of the examples we used was identical hot dog stands, side by side, where the only difference was price. If quality is the same, the rational consumer will always purchase the hot dog that is a lower price. From the perspective of the stand, they know that if they increase price even slightly, they will sell 0 units. This means that $E_D = \infty$.

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Using point-slope at any point in Figure 4.3a, we can confirm this.

$$\frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q} = ?$$

We know that $\frac{\Delta Q}{\Delta P}$ is equal to the inverse of the slope. In the demand curve in Figure 4.3a, when the ΔP>0 then ΔQ is equal to ∞. This means that $\frac{\Delta Q}{\Delta P} = \infty$.

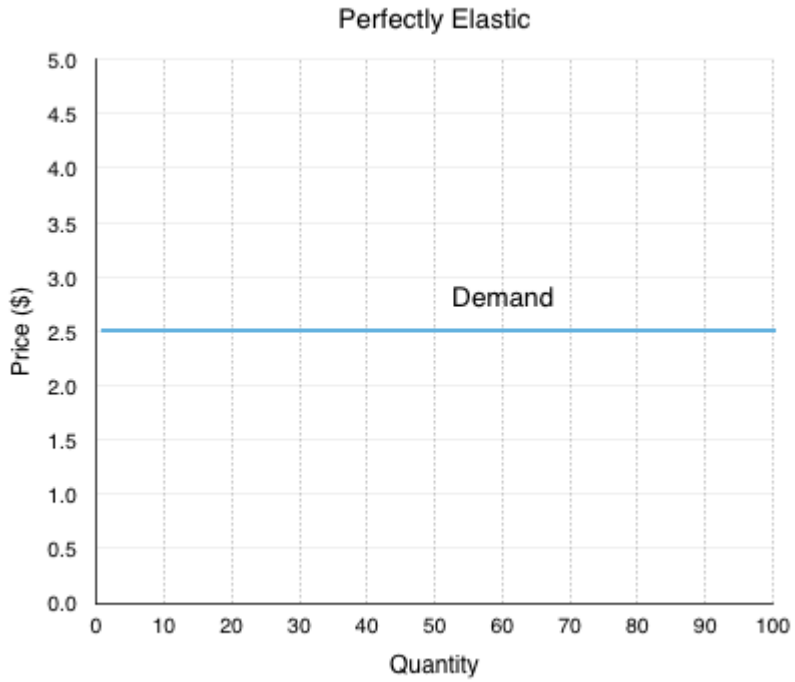

Figure-a

Perfectly Inelastic

At the other end of the spectrum, consider a market where the firm can continue to increase prices with no change in quantity. If you were poisoned and had to buy the antidote, would you be responsive to price change? Probably not. This is an example of a situation where demand is nearly perfectly inelastic. If you increase the price, quantity demanded does not change. This means that $E_D = 0$.

We can confirm this by using point-slope at any point in Figure 4.4a.

In the demand curve in Figure 4.3a, when the ΔP>0 then ΔQ is equal to 0. This means that $\frac{\Delta Q}{\Delta P} = 0$.

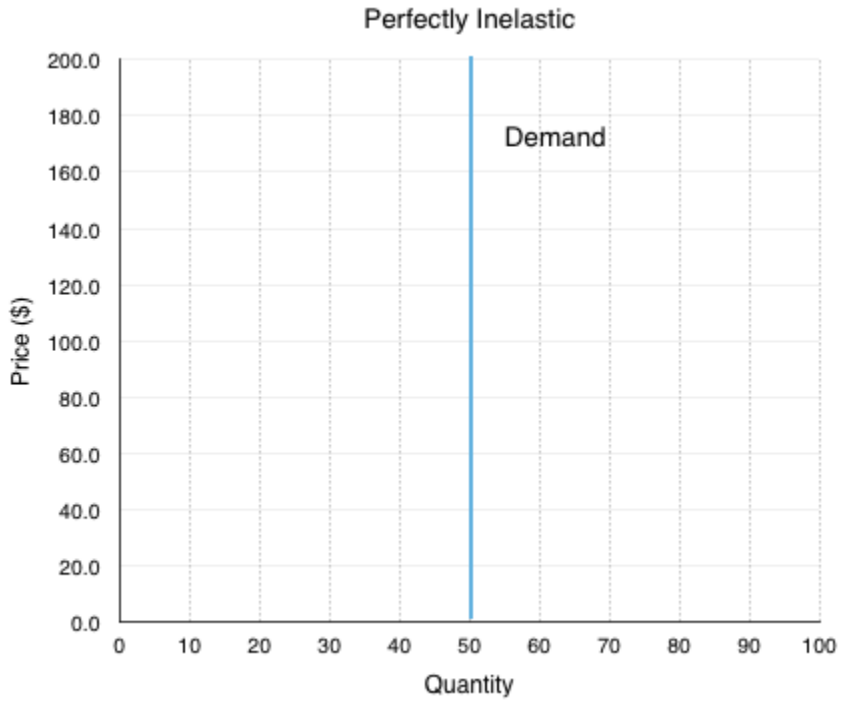

Figure -b

Relative Elasticity

The concepts of perfectly elastic and perfectly inelastic lead us into a discussion of relative elasticity. In 4.1 and 4.2, we examined a single demand curve, and looked at the numerical value of elasticity along that demand curve. However, elasticity can also be useful when comparing demand curves. Even though each demand curve has an inelastic, elastic, and unit elastic section, the comparison of the curves can show which markets are relatively more responsive to price changes. This is an important concept to understand for when we look at the impacts of a policy change.

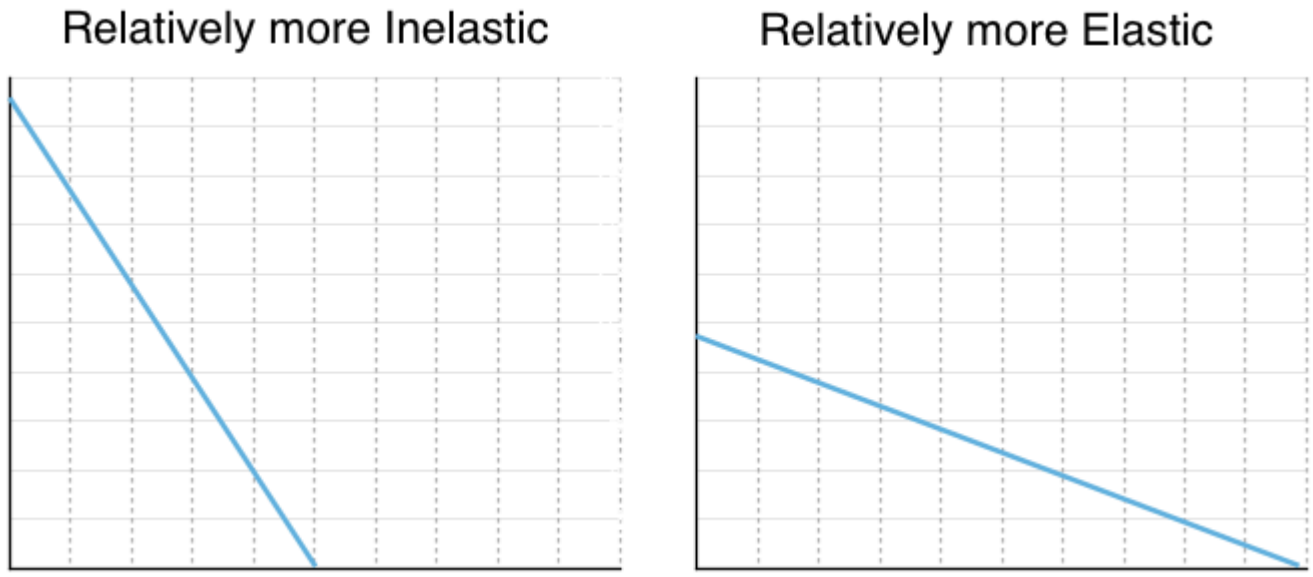

Figure- c

Figure 4.3c illustrates two curves. One is relatively more inelastic and the other is relatively more elastic. The best way to determine which is more elastic or inelastic is to compare each curve to the extremes. The curve more resemblant of perfect elasticity is relatively more elastic, the curve more resemblant or perfect inelasticity is relatively more inelastic. Note this is

different than saying one is elastic and the other inelastic! To emphasize this point, read the section “Bears and Elasticity.”

The concept of relative elasticity is not based on the calculations in 4.1 and 4.2, as each demand curve has an inelastic, elastic and unit elastic region. Demand curves take the shape of anything between perfectly elastic and perfectly inelastic, and you can only judge relative elasticity in reference to other curves.

What About Supply

The same concepts and principles can be applied to supply. There is fairly significant variation across different industries, with some relatively more elastic than others.

Factors That Influence Relative Elasticity

So what causes this difference in relative elasticity? For the most part, external factors which influence responsiveness.

Demand

1. **Availability of substitutes**

The availability of substitutes is a strong factor in determining the elasticity of a good. If there are many close substitutes, then it is fairly easy for consumers to find a suitable alternative to a good if prices rise.

2. **Necessity of a good**

In addition, the extent to which a good is a necessity or a luxury greatly influences its elasticity. Essentials, such as soap, flour, sugar, etc. are generally purchased in the same quantity regardless of price. On the other hand, consumers are very price conscious when it comes to luxury goods (such as comforts, jewelry, etc.).

3. **Income**

The necessity of a good depends quite heavily on the customer's income. Someone with low income might be more price conscious (elastic) when purchasing a new sofa compared to someone with higher income. Generally the larger percentage of your income a good takes up, the more sensitive you will be to price changes.

Supply

Causes supply to be more or less elastic

1. **Availability of resources**

If a company's production is dependent on scarce resources, the company is less responsive to changes in price. Even if prices are high and the firm wants to increase production, it wont be able to without the proper inputs.

2. **Technological innovation**

Innovation tends to lead to more efficient production. If a firm benefits from top notch production technology, it will be more able to respond to an increase in price with an increase in production.

3. **Barriers to entry**

If there are few barriers to entry in an industry, an increase in price can cause a large increase in production as new firms quickly enter the market.

Time: The Ever-Constraining Factor

Both the elasticity of supply and demand are impacted by time. For the consumer, how much time they have to make a consumption decision. For the producer, how much time it has to produce the good and build inventory. Regardless of whether we are talking about supply or demand, an increase in time always increases the elasticity of a good by increasing the ability to act and make informed decisions.

Summary

Whereas hard labels such as elastic, unit elastic, and inelastic can be used to describe specific sections of supply and demand curves (based on a calculated value), when comparing two curves everything is relative. Using the knowledge of perfect elasticity and perfect inelasticity, we can compare two curves on the basis of elasticity to determine how responsive the general consumer group, industry, etc. is to price changes. A flatter curve is relatively more elastic than a steeper curve. Availability of substitutes, a goods necessity, and a consumers income all affect the relative elasticity of demand. The availability of resources, technological innovation, and the barriers to entry all affect the relative elasticity of supply. Time affects elasticity of either curve.

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Now that we have the tools of supply, demand and elasticity, we will use them to understand how government policy affects the market.

Glossary

Perfectly Elastic

The extremely elastic situation of demand or supply where quantity changes by an infinite amount in response to any change in price; horizontal in appearance

Perfectly Inelastic

the highly inelastic case of demand or supply in which a percentage change in price, no matter how large, results in zero change in the quantity; vertical in appearance

Indifference curve analysis of consumer behaviour

Concept of Indifference Curve

An indifference curve is a locus of combinations of goods which derive the same level of satisfaction, so that the consumer is indifferent to any of the combination he consumes.If a consumer equally prefers two product bundles, then the consumer is indifferent between the two bundles. The consumer gets the same level of satisfaction (utility) from either bundle. Graphically speaking, this is known as the indifference curve. An indifference curve shows combinations of goods between which a person is indifferent.

Symbolically, in the equation form,

An Indifference Curve =

U=f(x1,x2,x3,.....xn)=kU=f(x1,x2,x3,.....xn)=k

.....where, k is a constant.

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Significance of Indifference Curve Analysis:

In indifference curve approach only ordination of preferences is needed.It overcomes the weakness of Cardinal measurement as the satisfaction cannot be measured objectively.

The cardinal approach provides the assumption of constant utility of money, which is unrealistic.In indifference curve approach, this assumption has been dropped.

Indifference curve approach is base for the measurement of 'consumer's surplus'.In a way it contributes to the Welfare economics.

Indifference curve is a better tool to classify substitutes and complementary goods

Properties of Indifference Curves

The main attributes or properties or characteristics of indifference curves are as follows:

1) Indifference Curves are Negatively Sloped:

The indifference curves must slope downward from left to right. As the consumer increases the consumption of X commodity, he has to give up certain units of Y commodity in order to maintain the same level of satisfaction.

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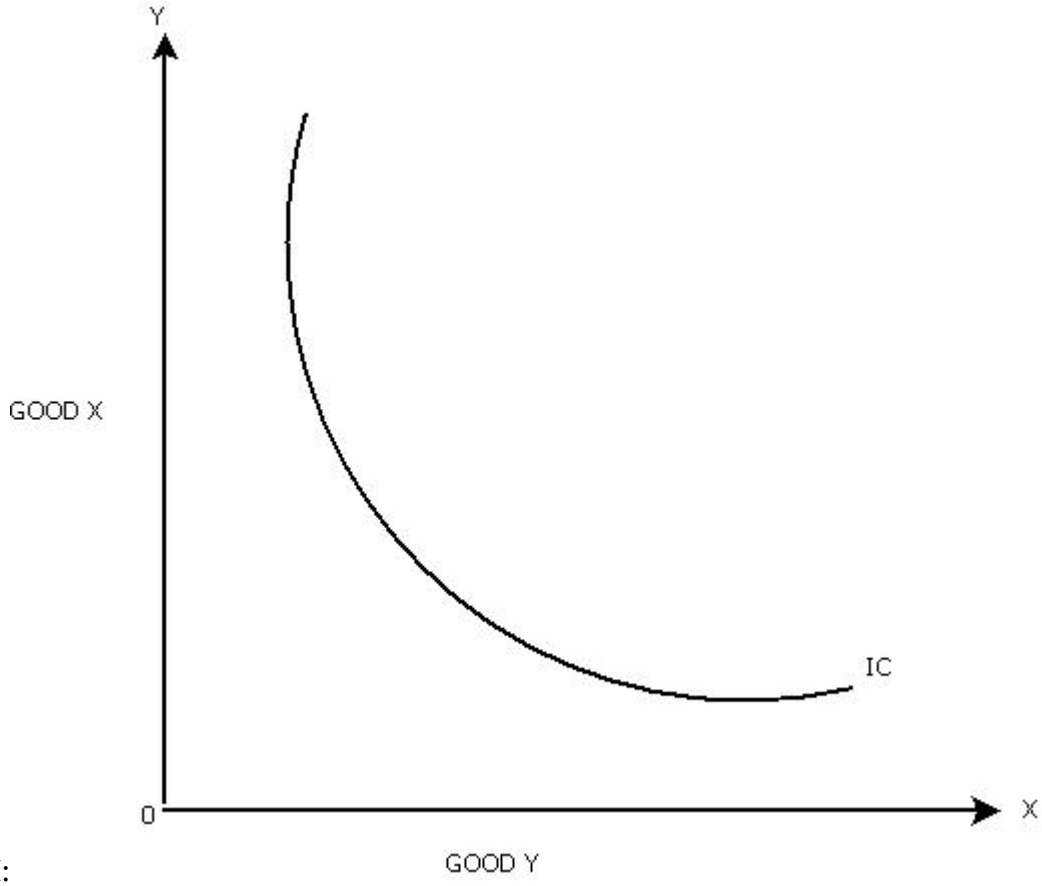

DIAGRAM:

In the above diagram, two combinations of commodity cooking oil and commodity wheat is shown by the points a and b on the same indifference curve. The consumer is indifferent towards points a and b as they represent equal level of satisfaction.

(2) Higher Indifference Curve Represents Higher Level of Satisfaction:

Indifference curve that lies above and to the right of another indifference curve represents a higher level of satisfaction. The combination of goods which lies on a higher indifference curve will be preferred by a consumer to the combination which lies on a lower indifference curve.

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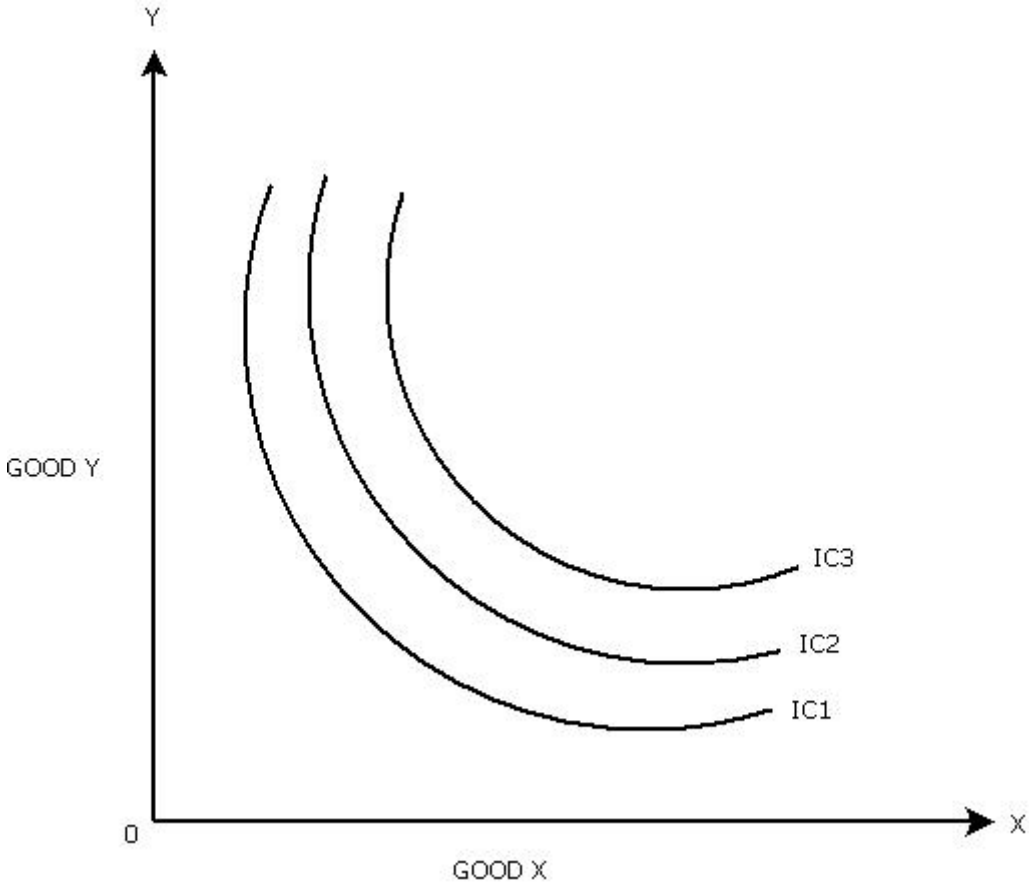
Diagram:

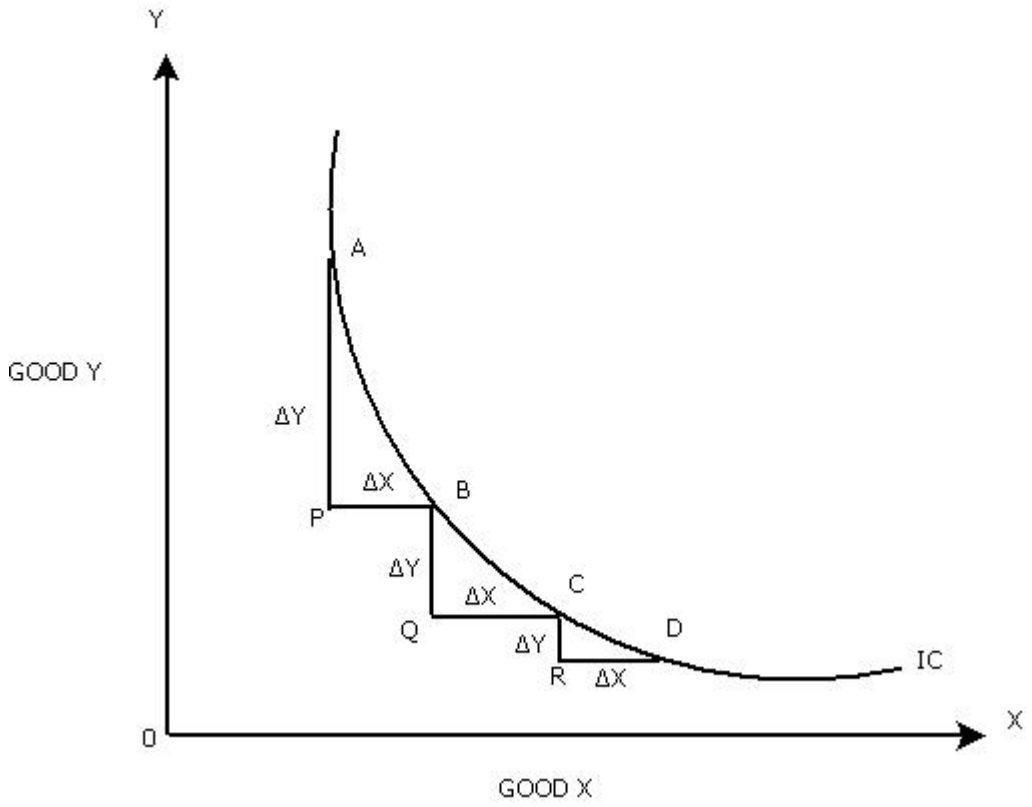


In this diagram, there are three indifference curves, IC1, IC2 and IC3 which represents different levels of satisfaction. The indifference curve IC3 shows greater amount of satisfaction and it contains more of both goods than IC2 and IC1. IC3 > IC2> IC1.

(3) Indifference Curves are Convex to the Origin:

This is an important property of indifference curves. They are convex to the origin. As the consumer substitutes commodity X for commodity Y, the marginal rate of substitution diminishes as X for Y along an indifference curve. The Slope of the curve is referred as the Marginal Rate of Substitution. The Marginal Rate of Substitution is the rate at which the consumer must sacrifice units of one commodity to obtain one more unit of another commodity.

Diagram:



In the above diagram, as the consumer moves from A to B to C to D, the willingness to substitute good X for good Y diminishes. The slope of IC is negative.In the above diagram, diminishing MRSxy is depicted as the consumer is giving AF>BQ>CR units of Y for PB=QC=RD units of X. Thus indifference curve is steeper towards the Y axis and gradual towards the X axis. It is convex to the origin.

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If the indifference curve is concave, MRSxy increases. It violets the fundamental feature of consumer behaviour.

If commodities are almost perfect substitutes then MRSxy remains constant. In such cases the indifference curve is a straight line at an angle of 45 degree with either axis.

If two commodities are perfect complements, the indifference curve will have a right angle.

In reality, commodities are not perfect substitutes or perfect complements to each other. Therefore MRSxy usually diminishes.

(4) Indifference Curves cannot Intersect Each Other:

The indifference curves cannot intersect each other. It is because at the point of tangency, the higher curve will give as much as of the two commodities as is given by the lower indifference curve. This is absurd and impossible.

Diagram:

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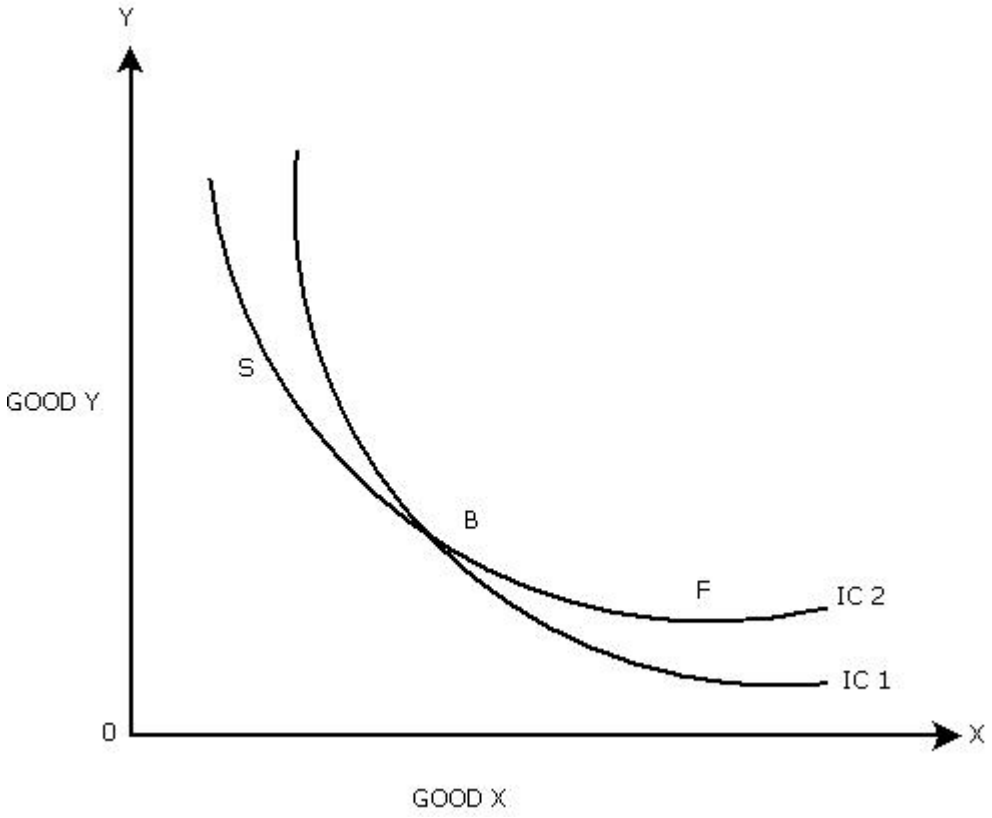

In the above diagram, two indifference curves are showing cutting each other at point B. The combinations represented by points B and F given equal satisfaction to the consumer because both lie on the same indifference curve IC2. Similarly the combinations shows by points B and E on indifference curve IC1 give equal satisfaction top the consumer.

If combination F is equal to combination B in terms of satisfaction and combination E is equal to combination B in satisfaction. It follows that the combination F will be equivalent to E in terms of satisfaction. This conclusion looks quite funny because combination F on IC2 contains more of good Y (wheat) than combination which gives more satisfaction to the consumer. We, therefore, conclude that indifference curves cannot cut each other.

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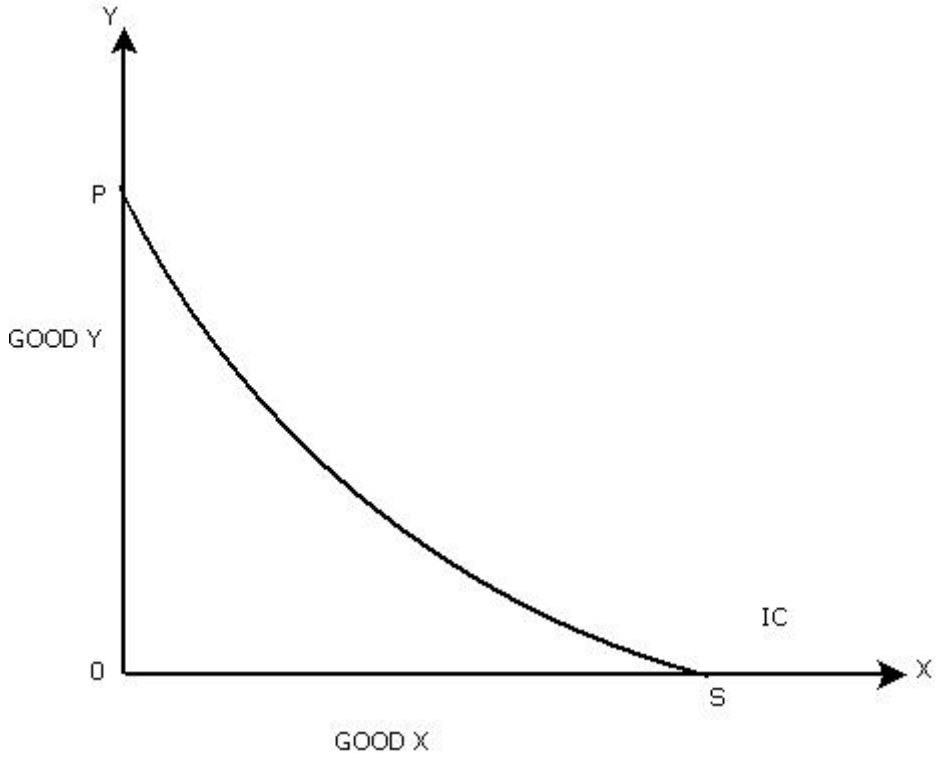
(5) Indifference Curves do not Touch the Horizontal or Vertical Axis:

One of the basic assumptions of indifference curves is that the consumer purchases combinations of different commodities. He is not supposed to purchase only one commodity. In that case indifference curve will touch one axis. This violates the basic assumption of indifference curves.

Diagram:



In the above diagram, it is shown that the in difference IC touches Y axis at point P and X axis at point S. At point C, the consumer purchase only OP commodity of Y good and no commodity of X good, similarly at point S, he buys OS quantity of X good and no amount of Y

good. Such indifference curves are against our basic assumption. Our basic assumption is that the consumer buys two goods in combination

Consumer Equilibrium

When consumers make choices about the quantity of goods and services to consume, it is presumed that their objective is to **maximize total utility.** In maximizing total utility, the consumer faces a number of **constraints**, the most important of which are the consumer's *income* and the *prices* of the goods and services that the consumer wishes to consume. The consumer's effort to maximize total utility, subject to these constraints, is referred to as the **consumer's problem.** The solution to the consumer's problem, which entails decisions about how much the consumer will consume of a number of goods and services, is referred to as **consumer equilibrium.**

Determination of consumer equilibrium.

Consider the simple case of a consumer who cares about consuming only two goods: good 1 and good 2. This consumer knows the prices of goods 1 and 2 and has a fixed income or budget that can be used to purchase quantities of goods 1 and 2. The consumer will purchase quantities of goods 1 and 2 so as to completely exhaust the budget for such purchases. The actual quantities purchased of each good are determined by the condition for consumer equilibrium, which is

$$\frac{\text{marginal utility of good 1}}{\text{price of good 1}} = \frac{\text{marginal utility of good 2}}{\text{price of good 2}} = \cdots = \frac{\text{marginal utility of good } N}{\text{price of good } N}$$

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This condition states that the marginal utility per dollar spent on good 1 must equal the marginal utility per dollar spent on good 2. If, for example, the marginal utility per dollar spent on good 1 were higher than the marginal utility per dollar spent on good 2, then it would make sense for the consumer to purchase more of good 1 rather than purchasing any more of good 2. After purchasing more and more of good 1, the marginal utility of good 1 will eventually fall due to the law of diminishing marginal utility, so that the marginal utility per dollar spent on good 1 will eventually equal that of good 2. Of course, the amount purchased of goods 1 and 2 cannot be limitless and will depend not only on the marginal utilities per dollar spent, but also on the consumer's budget.

An example.

To illustrate how the consumer equilibrium condition determines the *quantity* of goods 1 and 2 that the consumer demands, suppose that the price of good 1 is $2 per unit and the price of good 2 is $1 per unit. Suppose also that the consumer has a budget of $5. The marginal utility (*MU*) that the consumer receives from consuming 1 to 4 units of goods 1 and 2 is reported in Table . Here, marginal utility is measured in fictional units called *utils*, which serve to quantify the consumer's additional utility or satisfaction from consuming different quantities of goods 1 and 2. The larger the number of utils, the greater is the consumer's marginal utility from consuming that unit of the good. Table also reports the ratio of the consumer's marginal utility to the price of each good. For example, the consumer receives 24 utils from consuming the first unit of good 1, and the price of good 1 is $2. Hence, the ratio of the marginal utility of the first unit of good 1 to the price of good 1 is 12.

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TABLE 1 Illustration of Consumer Equilibrium. Price of good 1 = $2, Price of good 2 = $1, Budget = $5

Units of good 1	*MU* of good 1	*MU*/price of good 1	Units of good 2	*MU* of good 2	*MU*/price of good 2
1	24	12	1	9	9
2	18	9	2	8	8
3	12	6	3	5	5
4	6	3	4	1	1

The consumer equilibrium is found by comparing the marginal utility per dollar spent (the ratio of the marginal utility to the price of a good) for goods 1 and 2, subject to the constraint that the consumer does not exceed her budget of $5. The marginal utility per dollar spent on the first unit of good 1 is greater than the marginal utility per dollar spent on the first unit of good 2(12 utils> 9 utils). Because the price of good 1 is $2 per unit, the consumer can afford to purchase this first unit of good 1, and so she does. She now has $5 − $2 = $3 remaining in her budget. The consumer's next step is to compare the marginal utility per dollar spent on the *second* unit of good 1 with marginal utility per dollar spent on the *first* unit of good 2. Because these ratios are both equal to 9 utils, the consumer is *indifferent* between purchasing the second unit of good 1 and first unit of good 2, so she purchases both. She can afford to do so because the second unit of good 1 costs $2 and the first unit of good 2 costs $1, for a total of $3. At this point, the consumer has exhausted her budget of $5 and has arrived at the consumer

equilibrium, where the marginal utilities per dollar spent are equal. The consumer's equilibrium choice is to purchase 2 units of good 1 and 1 unit of good 2.

The condition for consumer equilibrium can be extended to the more realistic case where the consumer must choose how much to consume of many different goods. When there are $N > 2$ goods to choose from, the consumer equilibrium condition is to equate all of the marginal utilities per dollar spent,

$$\frac{\text{marginal utility of good 1}}{\text{price of good 1}} = \frac{\text{marginal utility of good 2}}{\text{price of good 2}} = \cdots = \frac{\text{marginal utility of good } N}{\text{price of good } N}$$

Price Consumption Curve and Price Elasticity Demand

It is possible to determine whether an individual's demand curve for a commodity is elastic, unitary elastic or inelastic directly from the slope of the PCC. We know that the PED (E_p) is given by the percentage change in the quantity demanded of a good divided by the percentage change in its price, a, at par.

Demand is said to be elastic, unitary elastic or inelastic depending on whether $E_p$exceeds 1, is equal to 1, or less than 1, respectively. This can be determined directly from the shape of the PCC. To be more specific, the demand curve is elastic, unitary elastic or inelastic depending on whether the PCC falls, is horizontal or rises.

We can show this with Fig. 10. The horizontal axis in each part of the diagram measures the quantity of good X purchased per period (as usual). But, instead of measuring the quantity of good Y along the vertical axis, we now measure money spent on all goods other than X.

This means that the vertical distance from the point where the budget line meets the vertical axis to the point which corresponds to the optimum purchase by the consumers indicates the

Fig. 10: Price consumption curve amount of money spent on X. Fig. 10(a) shows that as P_x falls, total outlay on X increases.

This gives a PCC that slopes downward, implying that the demand for X is price elastic. In part (b), a fall in P_x leaves outlay (expenditure) on X unchanged. Thus, the PCC is horizontal and demand for X is unitary price elastic. Finally, in C the PCC slopes upward, total output on X falls and the demand for X is inelastic.

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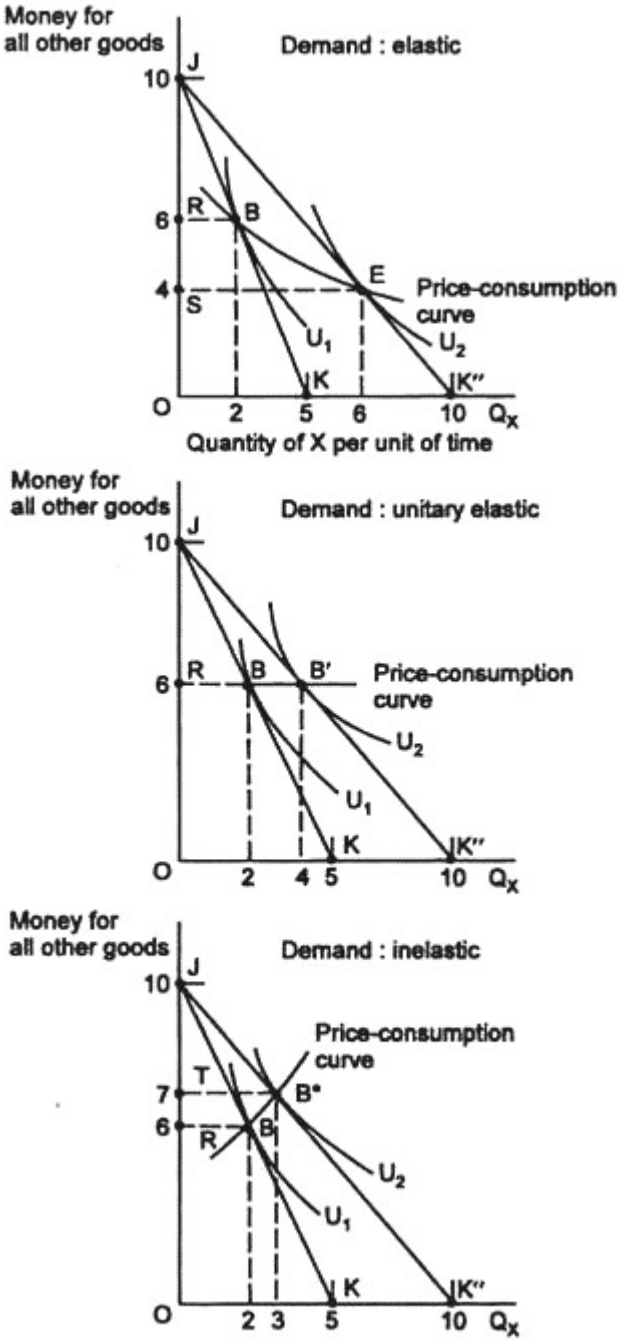

Fig. 10 : Price consumption curve

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To sum up, the demand curve for a commodity (X) is price elastic, unitary elastic or inelastic depending on whether the PCC is negatively, zero or positively sloped, respectively. One can verify this by using formula for measuring arc elasticity.

Income Consumption Curve and Engel Curve (with curve diagram)

In indifference curve map income consumption curve is the locus of the equilibrium quantities consumed by an individual at different levels of his income.

Thus, the income consumption curve (ICC) can be used to derive the relationship between the level of consumer's income and the quantity purchased of a commodity by him.

A nineteenth century German statistician Ernet Engel (1821-1896) made an empirical study of family budgets to draw conclusions about the pattern of consumption expenditure, that is, expenditure on different goods and services by the households at different levels of income. The conclusions he arrived at are still believed to be generally valid.

According to Engel's studies, as the income of a family increases, the proportion of its income spent on necessities such as food falls and that spent on luxuries (consisting of industrial goods and services) increases. In other words, the poor families spend relatively large proportion of their income on necessities, whereas rich families spend a relatively a large part of their income on luxuries.

This change in the pattern of consumption expenditure (that is, decline in the proportion of income spent on food and other necessities and increase in the proportion of income spent on luxuries) with the rise in income of the families has been called Engel's law.

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Though Engel dealt with the relationship between income and expenditure on different goods, in order to keep our analysis simple we will describe and explain the relationship between income and quantities purchased of goods. However, both types of relations will convey the same information about individual's consumption behaviour as in our analysis of Engel's curve the prices of goods are held constant.

The curve showing the relationship between the levels of income and quantity purchased of particular commodities has therefore been called Engel curve. In what follows we explain how an Engel curve is derived from income consumption curve. In our analysis of Engel curve we relate quantity purchased of a commodity, rather than expenditure on it, to the level of consumer's income.

It is worth noting that like the demand curve depicting relationship between price and quantity purchased, other factors remaining the same, Engel curve shows relationship between income and quantity demanded, other influences on quantity purchased such as prices of goods, consumer preferences are assumed to be held constant.

For deriving Engel curve from income consumption curve we plot level of income on the Y-axis and quantity purchased of a commodity on the X-axis. Consider panel (a) in Fig. 8.33. Given the indifference map representing the preferences of a consumer and the prices of two goods X and Y, ICC is the income consumption curve showing the equilibrium quantities purchased of commodities by the consumer as his income increases from Rs. 300 to Rs. 400 and to Rs. 500 per day.

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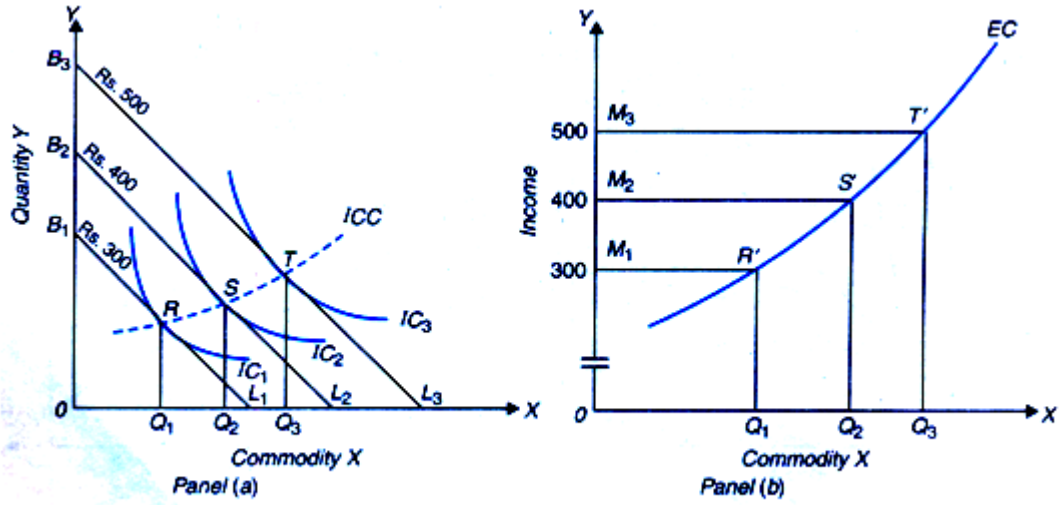

Fig. 8.33. *Deriving Engel Curve from Income Consumption Curve in Case of Necessities*

It will be seen from panel (a) of Fig. 8.33 that when income is Rs. 300, given prices of goods X and Y, the consumer is buying OQ_1 quantity of the commodity X. In panel (b) of Fig. 8.33 in which level of income is represented on the vertical axis and quantity purchased of commodity X on the horizontal axis we directly plot quantity OQ_1 against income level of Rs. 300.

Fig. 8.34. *Engel Curve of a Luxury*

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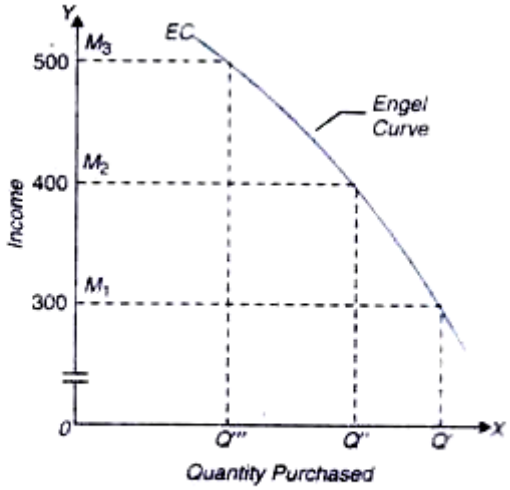

Fig. 8.35. *Backward Bending Engel Curve of an Inferior Good*

As income increases to Rs. 400, prices of goods remaining constant, the budget line in panel (a) shifts outward to the left to the new position B_2L_2 with which consumer is in equilibrium at point S and the consumer buys OQ_2 quantity of good X. Thus, in panel (b) of Fig. 8.33 we plot quantity purchased OQ_2 of commodity X against income level of Rs. 400. Likewise, as income further rises to Rs. 500, budget line in panel (a) shifts to B_3L_3 and the consumer buys OQ_3 quantity of X in his new equilibrium position at T. Therefore, in panel (b) of Fig. 8.33. OQ_3 we plot OQ_3 against income of Rs. 500.

Thus equilibrium points constituting the income consumption curve in consumer's indifference map have been transformed into Engel curve depicting quantity-income relationship. Each point of an Engel curve corresponds to a relevant point of income consumption curve. Thus R' of the Engel curve EC corresponds to point R on the ICC curve. As seen from panel (b), Engel curve for normal goods is upward-sloping which shows that as income increases, consumer buys more of a commodity.

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The slope of Engel curve EC drawn in panel (b) of Figure 8.33 equals AM/AQ where AM stands for change in income and AQ for change in quantity demanded of good X and has a positive sign. It is important to note that the slope of the Engel curve in Fig. 8.33 (panel (b)) increases as income increases. This indicates that with every equal increase in income, expansion in quantity purchased of the good successively declines.

This upward-sloping Engel curve with increasing slope as income rises depicts the case of necessities, consumption of which increases relatively less as income rises. For instance, in Fig. 8.33 when income is initially Rs. 300 (= M_1) per week, the quantity purchased of the good X equals OQ_1 and when income rises by Rs. 100 to Rs. 400 (= Mg_2) per week he increases his consumption to OQ_2, that is, by quantity Q_1 Q_2.

Now, when his income per week further increases by Rs. 100 to Rs. 500 per week, the quantity consumed increases to OQ_3, that is, by Q_2Q_3 this is less than Q_1Q_2. Thus, in Engel curve drawn in panel (b) of Fig. 8.33 quantity purchased of the commodity increases with the increase in income but at a decreasing rate. This shape of the Engel curve is obtained for necessities.

The Engel curve drawn in Fig.8.34 is upward-sloping but is concave. This implies that slope of the Engel curve ($\Delta M/\Delta Q$) is declining with the increase in income. That is, in the Engel curve of a commodity depicted in Fig. 8.34 the equal increments in income result in successively larger increases in the quantity purchased of the commodity. Thus, in Fig. 8.34 at income of Rs. 300 the consumer purchases OQ_1 quantity of a commodity.

The increase in income by Rs. 100 to Rs. 400 results in increase in quantity purchased of the commodity equal to Q_1Q_2. With the further increase in income by the same amount of Rs. 100 to Rs. 500, the quantity purchased increases by Q_2Q_3 which is much larger than Q_1Q_2. This implies that as a consumer becomes richer he purchases relatively more of the commodity. Such commodities are called luxuries. Examples of luxuries are air travel, luxury cars, costly woollen suits, air conditioners, costly fruits, etc.

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In case of inferior goods, consumption of the commodity declines as income increases. Engel curve of an inferior good is drawn in Figure 8.35 which is backward bending indicating a fall in the quantity purchased of the good as income increases.

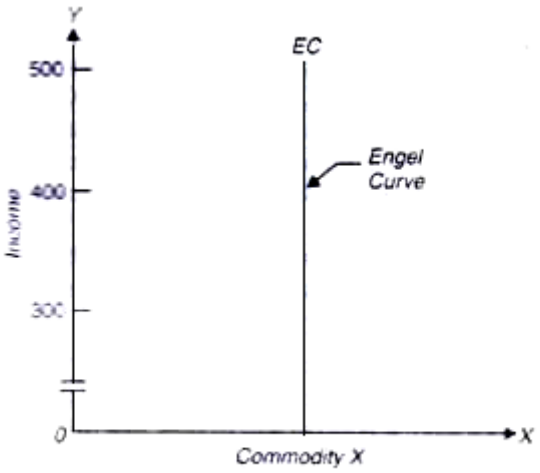

Fig. 8.36. Engel Curve of a Neutral Good

An extreme case of Engel curve is a vertical straight line as drawn in Fig. 8.36. This represents the case of a neutral commodity which is quite unresponsive to the increase in income. The Engel curve of the shape of a vertical straight line shows that a person goes on consuming the same amount of a commodity whatever the level of his income. For example, the quantity of common salt purchased by a family remains the same, determined as it is by food habits, with the increase in their income.

Substitution vs. Income Effect (and its Implications)

Income Effect, Substitution Effect and Price Effect!

In the above analysis of the consumer's equilibrium it was assumed that the income of the consumer remains constant, given the prices of the goods X and Y. Given the tastes and preferences of the consumer and the prices of the two goods, if the income of the consumer changes, the effect it will have on his purchases is known as the income Effect.

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If the income of the consumer increases his budget line will shift upward to the right, parallel to the original budget line. On the contrary, a fall in his income will shift the budget line inward to the left. The budget lines are parallel to each other because relative prices remain unchanged.

In Figure 12.14 when the budget line is PQ, the equilibrium point is R where it touches the indifference curve I_1. If now the income of the consumer increases, PQ will move to the right as the budget line P_1, I_1, and the new equilibrium point is S where it touches the indifference curve I_2. As income increases further, PQ becomes the budget line with T as its equilibrium point.

The locus of these equilibrium points R, S and T traces out a curve which is called the income-consumption curve (ICC). The ICC curve shows the income effect of changes in consumer's income on the purchases of the two goods, given their relative prices.

Normally, when the income of the consumer increases, he purchases larger quantities of two goods. In Figure 12.14 he buys RA of Y and OA of X at the equilibrium point R on the budget line PQ. As his income increases, he buys SB of Y and OB of X at the equilibrium point S on P_1, Q_1, budget line and still more of the two goods TC of Y and OC of X, on the budget line P_2Q_2. Usually, the income consumption curve slopes upwards to the right as shown in Figure 12.14.

But an income-consumption curve can have any shape provided it does not intersect an indifference curve more than once. We can have five types of income consumption curves. The first type is explained above in Figure 12.14 where the ICC curve has a positive slope throughout its range. Here the income effect is also positive and both X and Y are normal goods.

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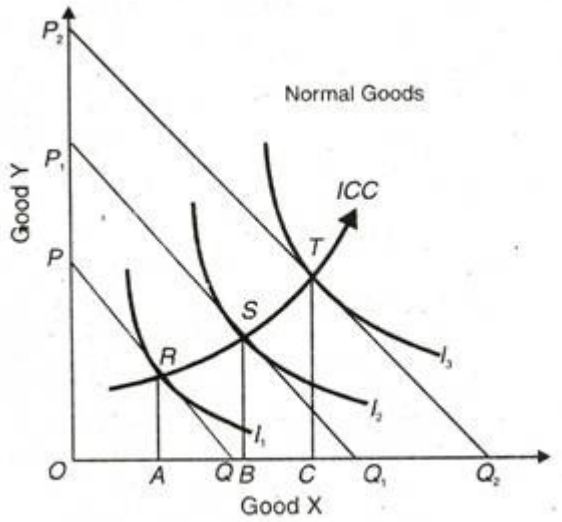

Fig. 12.14

The second type of ICC curve may have a positive slope in the beginning but become and stay horizontal beyond a certain point when the income of the consumer continues to increase. In Figure 12.15 (A) the ICC curve slopes upwards with the increase in income upto the equilibrium point R at the budget line P_1Q_1 on the indifference cure I_2. Beyond this point it becomes horizontal which signifies that the consumer has reached the saturation point with regard to the consumption of good Y. He buys the same amount of Y (RA) as before despite further increases in his income. It often happens in the case of a necessity (like salt) whose demand remains the same even when the income of the consumer continues to increase further. Here Y is a necessity. Figure 12.15 (B) shows a vertical income consumption curve when the consumption of good X reaches the saturation level R on the part of the consumer. He has no inclination to increase its purchases despite further increases in his income. He continues to purchase OA of it even at higher income levels. Thus X is a necessity here.

The last two types of income consumption curves relate to inferior goods. The demand of inferior goods falls, when the income of the consumer increases beyond a certain level, and he

replaces them by superior substitutes. He may replace coarse grains by wheat or rice, and coarse cloth by a fine variety. In Figure 12.15 (C), good Y is inferior and X is a superior or luxury good.

Up to point R the ICC curve has- a positive slope and beyond that it is negatively inclined. The consumer's purchases of Y fall with the increase in his income. Similarly in Figure 12.15 (D), good X is shown as inferior and Y is a superior good beyond the equilibrium point R when the ICC curve turns back upon itself. In both these cases the income effect is negative beyond point R on the income-consumption curve ICC.

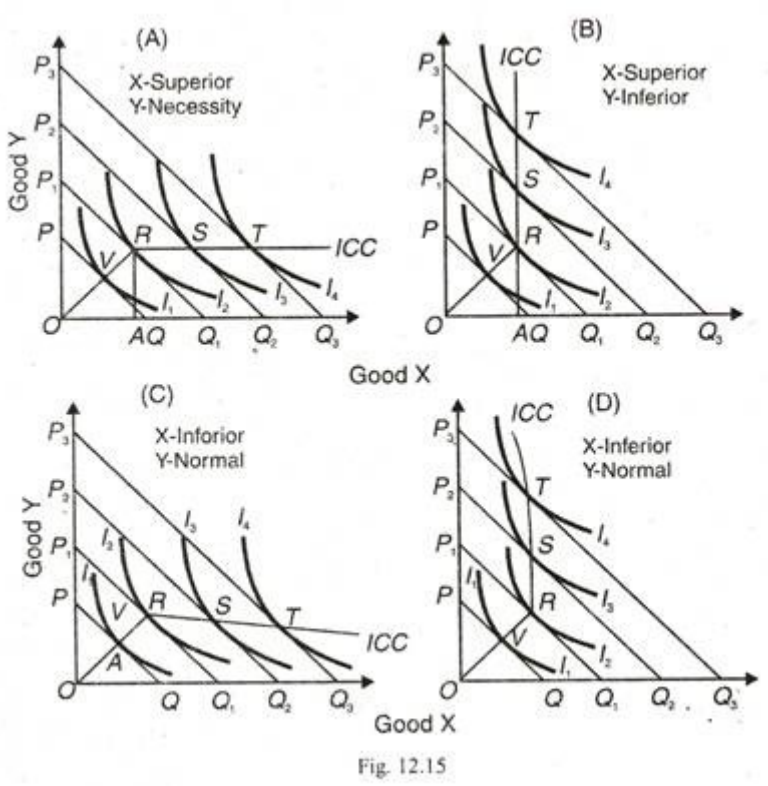

Fig. 12.15

The different types of income-consumption curves are also shown in Figure 12.16 where: (1) ICC_1 Alternative Method, has a positive slope and relates to normal goods; (2) ICC_2 is horizontal from point A, X is a normal good while Y is a necessity of which the consumer does not want to have more than the usual quantity as his income increases further: (3) ICC_3 is vertical

from A, K is a normal good here and X is satiated necessity; (4) ICC_4 is negatively inclined downwards, Y becomes an inferior good form A onwards and X is a superior good; and (5) ICC_5 shows X as an inferior good.

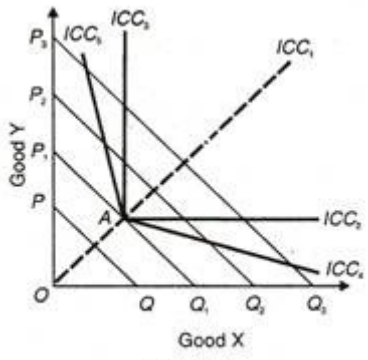

Fig. 12.16

The Substitution Effect:

The substitution effect relates to the change in the quantity demanded resulting from a change in the price of good due to the substitution of relatively cheaper good for a dearer one, while keeping the price of the other good and real income and tastes of the consumer as constant. Prof. Hicks has explained the substitution effect independent of the income effect through compensating variation in income. "The substitution effect is the increase in the quantity bought as the price of the commodity falls, after adjusting income so as to keep the real purchasing power of the consumer the same as before. This adjustment in income is called compensating variations and is shown graphically by a parallel shift of the new budget line until it become tangent to the initial indifference curve."

Thus on the basis of the methods of compensating variation, the substitution effect measure the effect of change in the relative price of a good with real income constant. The increase in the real income of the consumer as a result of fall in the price of, say good X, is so withdrawn that he is neither better off nor worse off than before.

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The substitution effect is explained in Figure 12.17 where the original budget line is PQ with equilibrium at point R on the indifference curve I_1. At R, the consumer is buying OB of X and BR of Y. Suppose the price of X falls so that his new budget line is PQ_1. With the fall in the price of X, the real income of the consumer increases. To make the compensating variation in income or to keep the consumer's real income constant, take away the increase in his income equal to PM of good Y or Q_1N of good X so that his budget line PQ_1 shifts to the left as MN and is parallel to it.

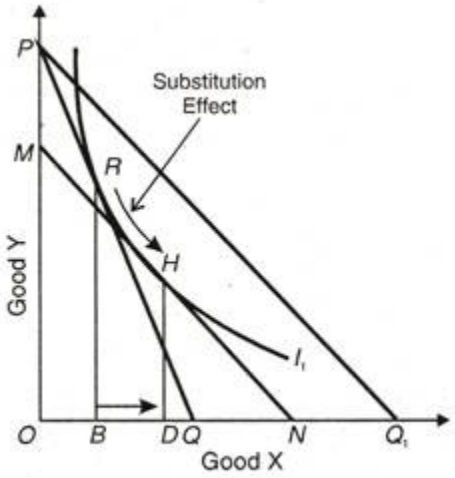

Fig. 12.17

At the same time, MN is tangent to the original indifference curve l_1 but at point H where the consumer buys OD of X and DH of Y. Thus PM of Y or Q_1N of X represents the compensating variation in income, as shown by the line MN being tangent to the curve I_1 at point H. Now the consumer substitutes X for Y and moves from point R to H or the horizontal distance from B to D. This movement is called the substitution effect. The substitution affect is always negative because when the price of a good falls (or rises), more (or less) of it would be purchased, the real income of the consumer and price of the other good remaining constant. In other words, the relation between price and quantity demanded being inverse, the substitution effect is negative.

The Price Effect:

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The price effect indicates the way the consumer's purchases of good X change, when its price changes, A given his income, tastes and preferences and the price of good Y. This is shown in Figure 12.18. Suppose the price of X falls. The budget line PQ will extend further out to the right as PQ_1, showing that the consumer will buy more X than before as X has become cheaper. The budget line PQ_2 shows a further fall in the price of X. Any rise in the price of X will be represented by the budget line being drawn inward to the left of the original budget line towards the origin.

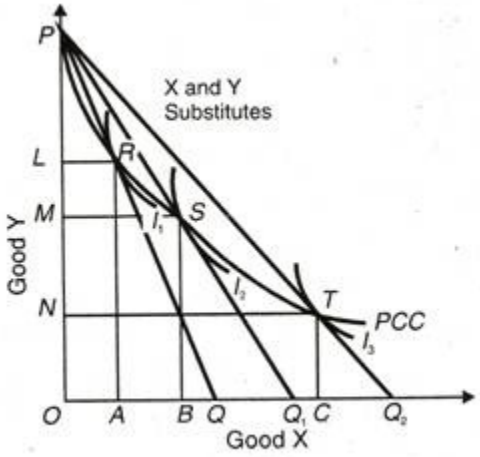

Fig. 12.18

If we regard PQ_2, as the original budget line, a two time rise in the price of X will lead to the shifting of the budget line to PQ_1, and PQ_2. Each of the budget lines fanning out from P is a tangent to an indifference curve I_1, I_2, and I_3 at R, S and T respectively. The curve PCC connecting the locus of these equilibrium points is called the price- consumption curve. The price-consumption curve indicates the price effect of a change in the price of X on the consumer's purchases of the two goods X and Y, given his income, tastes, preferences and the price of good Y.

Application of indifference curve

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The technique of indifference curves has been used not only to explain consumer's behaviour and demand but also to analyse and explain several other economic problems.

In other words, besides analysing consumer's demand, indifference curves have several other applications. Thus, indifference curves have been used to explain the concept of consumer's surplus, substitutability and complementarity of goods, supply curve of labour of an individual, several principles of welfare economics, burden of different forms of taxation, gain from foreign trade, welfare implications of subsidy granted by the Government, index number problem, mutual advantage of exchange of goods between two individuals and several other things. We shall explain below only few applications.

Lump-Sum Cash Subsidy:

Now, if instead of providing price subsidy on food, the Government gives lump-sum cash grant to the consumer equivalent to the cost of price subsidy on food, what will be its impact on the individual's welfare and consumption of food by him.

Food Stamp Programme: In-kind Food Subsidy:

Food stamp programme is a type of food subsidy to provide poor people with adequate quantity of food. It is a form of in-kind food subsidy in contrast to the subsidy provided in the form of cash income, often called cash subsidy. In the United States it was introduced in 1964 and was amended in 1979 and since then it continues there in the amended form.

In India also food stamp programme has been suggested in recent years as an anti-poverty measure. Under food stamp programme, some stamps or coupons are given to the eligible persons or households. With these stamps, the recipient can buy food and the recipient can buy

food and only food. That is, these food stamps cannot be used to buy non-food goods. Further, these stamps cannot be traded or transferred to the other people.

Let us explain how a receipt of food stamps affects the budget line, consumption of food and welfare of the individual. We will also demonstrate how the effect of food-stamp subsidy differs from cash subsidy. Consider Fig. 11.3 where along the X-axis we measure quantity of food and along the F-axis we measure money which represents all other goods, (i.e. goods other than food).

With a given money income OB_1 of an individual and given market price of food, B_1L_1 is the budget line whose slope represents the price of food (Note that price of money represented on the X-axis is Re. 1., that is, price of rupee one is Re. 1.). Before the receipt of food stamps the individual is in equilibrium at point E_1 on indifference curve IC_1 and is consuming OF_1 quantity of food and ON_1 quantity of other goods per week.

Now, suppose the individual is given food stamps of Rs. 200 per week which he can spend on food alone. Suppose further that price of food is Rs. 10 per kg. With stamps of Rs. 200 he can therefore buy 20 kg of food which is equal to B_1C at the given market price.

Since the consumer cannot use food stamps to buy non-food items (other goods) he cannot spend more than his initial income OB_1 on other goods. Thus above the horizontal line B_1C_1 the combinations of other goods and food are not attainable when he is given the food stamps of Rs. 200.

Since at the given market price of food, he can buy £,C amount of food with the food stamps of Rs. 200 provided to him, while spending his entire income OB on other goods. For instance, if price of food is Rs. 10 per kg., then with Rs. 200 he can buy 20 kg of food.

In this case, therefore, B_1C, will be equal to 20 kg. If the individual wants to buy more food-grains than B_1C, then he will spend some part of his initial income to purchase additional

food. Since the food stamps are in addition to his initial income OB_1 his budget line with food stamps becomes a kinked line B_1 CL_2.

The food stamp programme can affect the recipient in two ways. One possibility is that with the food-stamp subsidy and resultant kinked budget line B_1CL_2, in Fig. 11.3 the individual maximises his satisfaction at point E_2 where his budget line is tangent to indifference curve IC_2. At this new equilibrium point E_2 he is purchasing Of_2quantity of food and ON_2 other goods. Thus, as compared to the situation prior to food-stamp subsidy, he is on higher indifference curve showing a greater level of satisfaction or welfare and consuming greater quantities of food and other goods.

Thus, food stamps subsidy has led him to buy not only more food but also more of other goods. This means that a part of food stamp subsidy has been indirectly used for financing the purchases of non-food commodities.

It is important to note that in this possible case, the effect of food stamp subsidy is exactly the same as would be the case if cash subsidy is granted to the individual. Thus, if instead of the food stamps the individual is given equivalent cash income of B_1B_2 (Note that with given market price of food, cash income of B_1B_2 can buy B_1C quantity of food and thus the two are equivalent), the budget line will shift from L_2 to B_2 L_2.But given the preferences of the individual between food and other goods, he is in equilibrium at the same point E_2 at which his budget line B_2L_2 is target to the indifference curve IC_2. Thus, in this possibility, the effect of equivalent cash subsidy is exactly the same as the effect of food stamp subsidy.

This happens because the preferences of the individual between food and other commodities are such that he wants to have more than B_1C quantity of food which is the quantity of food provided under the food stamp subsidy.

Another important conclusion from this possible case is that with either food stamp subsidy or cash subsidy the individual buys more of both food and other goods than he buys

before the grant of subsidy. This is because food and other goods are here considered as normal goods whose quantity demanded increase with the increase in income.

Revealed Preference Theory (RPT) (With Diagram) put forth by prof. Samuelson.

The Concept of Revealed Preference:

Prof. Samuelson has invented an alternative approach to the theory of consumer behaviour which, in principle, does not require the consumer to supply any information about himself.

If his tastes do not change, this theory, known as the Revealed Preference Theory (RPT), permits us to find out all we need to know just by observing his market behaviour, by seeing what he buys at different prices, assuming that his acquisitions and buying experiences do not change his preference patterns or his purchase desires.

Given enough such information, it is even theoretically possible to reconstruct the consumer's indifference map.

Samuelson's RPT is based on a rather simple idea. A consumer will decide to buy some particular combination of items either because he likes it more than the other combinations that are available to him or because it happens to be cheap. Let us suppose, we observe that of two collections of goods offered for sale, the consumer chooses to buy A, but not B.

We are then not in a position to conclude that he prefers A to B, for it is also possible that he buys A, because A is the cheaper collection, and he actually would have been happier if he got B. But price information may be able to remove this uncertainty.

If their price tags tell us that A is not cheaper than B (or, B is no-more expensive than A), then there is only one plausible explanation of the consumer's choice—he bought A because he liked it better.

More generally, if a consumer buys some collection of goods, A, rather than any of the alternative collections B, C and D and if it turns out that none of the latter collections is more expensive than A, then we say that A has been revealed preferred to the combinations B, C and D or that B, C and D have been revealed inferior to A.

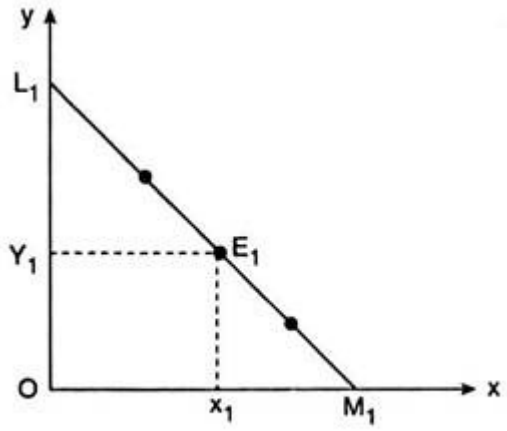

Fig. 6.104 Revealed preference

Therefore, if the consumer buys the combination E_1 (x_1, y_1)of the goods X and Y and does not buy the combination E_2(x_2, y_2) at the prices (p^1_x, p^1_y,) of the goods, then we would be able to say that he prefers combination E_1 to combination E_2, if we obtain

$$p_x^1 x_1 + p_y^1 y_1 \geq p_x^1 x_2 + p_y^1 y_2 \qquad (6.137)$$

The complete set of combinations of the goods X and Y to which a particular combination is revealed preferred can be found with the aid of the consumer's price line. Let us suppose that the consumer's budget line is L_1M_1 in Fig. 6.104 and he is observed to purchase the combination E_1 (x_1, y_1) that lies on this line.

Now, since the costs of all the combinations that lie on the budget line are the same as that of E_1 and since the costs of all the combinations that lie below and to the left of the budget line are lower than that of E_1 we may say that E_1 is revealed preferred to all the combinations lying on or below the consumer's budget line.

Again, since the costs of the combinations that lie above and to the right of the budget line are higher than that of E_1 we cannot say that the consumer prefers E_1 to these combinations when he is observed to buy E_1, because here E_1 is the cheaper combination.

We have to note here the difference between "preference" and "revealed preference". Combination A is **"preferred"** to B implies that the consumer ranks A ahead of B.

But A is "revealed preferred to B" means A is chosen when B is affordable (no-more-expensive). In our model of consumer behaviour, we generally assume that people are choosing the best combination they can afford that the choices they make are preferred to the choices that they could have made. That is, if $(x_1\ y_1)$ is directly revealed preferred to (x_2, y_2), then (x_1, y_1) is, in fact, preferred to (x_2, y_2).

Let us now state the RP principle more formally:

Let us suppose, the consumer is buying the combination (x_1, y_1) at the price set (p'_x, P'_y) let us also suppose that another combination is (x_2, y_2), such that $p'x_1 + p'_y y_1 \geq p'_x x_2 + p'_y y_2$. Now, if the consumer buys the most preferred combination subject to his budget constraint, then we will say the combination (x_1, y_1) is strictly preferred to combination (x_2, y_2).

The Assumptions:

With the help of the simple principle of RP, we may build up a powerful theory of consumer demand. The assumptions that we shall make here are:

(i) The consumer buys and uses only two goods (X and Y). The quantities x and y of these goods are continuous variables.

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(ii) Both these goods are of MIB (more-is-better) type. This assumption is also known as the assumption of monotonicity. This assumption implies that the ICs of the consumer are negatively sloped.

(iii) The consumer's preferences are strictly convex. This assumption implies that the ICs of the consumer would be convex to the origin, which again implies that there would be obtained only one point (the point of tangency) on the budget line of the consumer that would be chosen by him over all other affordable combinations.

This assumption is very important. On the basis of this assumption, we shall obtain a one- to-one relation between the consumer's price-income situation or budget line and his equilibrium choice—for any particular budget line of the consumer, there would be obtained one and only one equilibrium combination of goods and for any combination to be an equilibrium one, there would be obtained one and only one budget line.

(iv) The fourth assumption of the RP theory is known as the weak axiom of RP (WARP). Here we assume that if the consumer chooses the combination $E_1(x_1, y_1)$ over another affordable combination $E_2(x_2, y_2)$ in a particular price-income situation, then under no circumstances would he choose E_2 over E_1 if E_1 is affordable.

In other words, if a combination E_1 is revealed preferred to E_2, then, under no circumstances, E_2 can be revealed preferred to E_1.

(v) The fifth assumption of the RP theory is known as the strong axiom of RP (SARP). According to this assumption, if the consumer, under different price-income situations, reveals the combination E_1 as preferred to E_2, E_2 to E_3,…, E_{k-1} to E_k, then E_1 would be revealed preferred to E_k and E_k would never (under no price-income situation) be revealed preferred to E_1.

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KARPAGAM ACADEMY OF HIGHER EDUCATION

COURSE: III BCOM PA **SUBJECT: MICRO ECONOMICS**

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UNIT –II

Production and Cost

Decisions about production require individual agents to make decisions about the allocation and use of physical inputs. Objectives of agents, technology, availability and quality of inputs determine the nature of these decisions. Since the objectives are often pecuniary, it is often necessary to relate the decisions about the physical units of inputs and outputs to the costs of production. f the prices of the inputs and the production relationships are known (or understood), it is possible to calculate or estimate all the cost relationships for each level of output. In practice however, the decision maker will probably have partial information about some of the costs and will need to estimate production relationships in order to make decisions about the relative amounts of the different inputs to be used. A.

Production

Production is the process of altering resources or inputs so they satisfy more wants. Before goods can be distributed or sold, they must be produced. Production, more specifically, the technology used in the production of a good (or service) and the prices of the inputs determine the cost of production. Within the market model, production and costs of production are reflected in the supply function.

Production processes increase the ability of inputs (or resources) to satisfy wants by: • a change in physical characteristics • a change in location • a change in time • a change in ownership t its most simplistic level, the economy is a social process that allocates relatively scarce resources to satisfy relatively unlimited wants. To achieve this objective, inputs or resources must be allocated to those uses that have the greatest value. In a market setting, this is achieved by buyers (consumers) and sellers (producers) interacting. Consumers or buyers wish to maximize their utility or satisfaction given (or constrained by) their incomes, preferences and the prices of the goods they may buy. The behavior of the buyers or consumers is expressed in the demand function. The producers and/or sellers have other objectives. Profits may be either

an objective or constraint. As an objective, a producer may seek to maximize profits or minimize cost per unit. As a constraint the agent may desire to maximize "efficiency," market share, rate of growth or some other objective constrained by some "acceptable level D I P P A © R. Larry Reynolds 2005 Alternative Microeconomics – Part II, Chapter 10– Production and Cost Page 2 of profits. In the long run, a private producer will probably find it necessary to produce an output that can be sold for more than it costs to produce. The costs of production (Total Cost, TC) must be less than the revenues (Total Revenue, TR).

Given a production relationship (Q = f (labour, land, capital, technology, …)) and the prices of the inputs, all the cost relationships can be calculated. Often, in the decision making process, information embedded in cost data must be interpreted to answer questions such as; • "How many units of a good should be produced (to achieve the objective)?" • "How big should may plant be?' or How many acres of land should I plant in potatoes?" Once the question of plant size is answered, there are questions, • "How many units of each variable input should be used (to best achieve the objective)?" • "To what degree can one input be substituted for another in the production process?" he question about plant size involves long run analysis. The questions about the use of variable inputs relate to short-run analysis. In both cases, the production relationships and prices of the inputs determine the cost functions and the answers to the questions.

Often decision-makers rely on cost data to choose among production alternatives. In order to use cost data as a "map" or guide to achieve production and/or financial objectives, the data must be interpreted. The ability to make decisions about the allocation and use of physical inputs to produce physical units of output (Q or TP) requires an understanding of the production and cost relationships. he production relationships and prices of inputs determine costs. Here the production relationships will be used to construct the cost functions. In the decision making process, incomplete cost data is often used to make production decisions. The theory of production and costs provides the road map to the achievement of the objectives.

Production Function

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Production function is a model (usually mathematical) that relates possible levels of physical outputs to various sets of inputs, eg. Q = f (Labour, Kapital, Land, technology, . . .). To simplify the world, we will use two inputs Labour (L) and Kapital (K) so, Q = f (L, K, technology, ...). ere we will use a Cobb-Douglas production function that usually takes the form; Q = ALa Kb. In this simplified version, each production function or process is limited to increasing, constant or decreasing returns to scale over the range of production. In more complex production processes, "economies of scale" (increasing returns) may initially occur. As the plant becomes larger (a larger fixed input in each successive short-run period), constant returns may be expected. Eventually, decreasing returns or "diseconomies of scale" may be expected when the plant size (fixed input) becomes "too large." This more complex production function is characterized by a long run average cost (cost per unit of output) that at first declines (increasing returns), then is horizontal (constant returns) and then rises (decreasing returns).

Iso-Quant Curve: Definitions, Assumptions and Properties

Iso-Quant Curve: Definitions, Assumptions and Properties!

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.

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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 (MRTS).

Definitions:

"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

"An Iso-quant is a curve showing all possible combinations of inputs physically capable of producing a given level of output." Ferguson

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.

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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

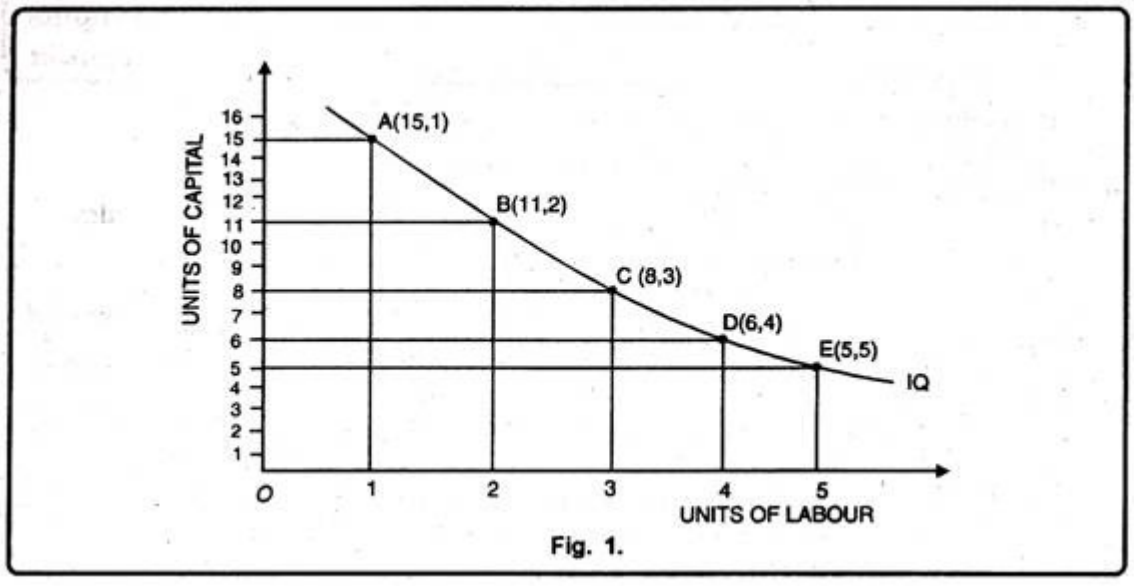

Fig. 1.

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.

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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.

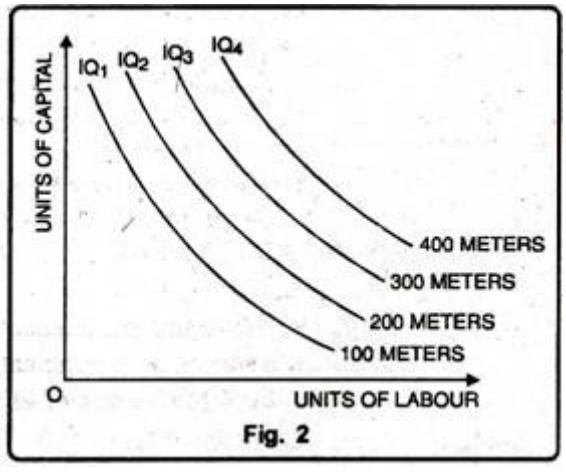

Fig. 2

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.

The downward sloping iso-product curve can be explained with the help of the following figure:

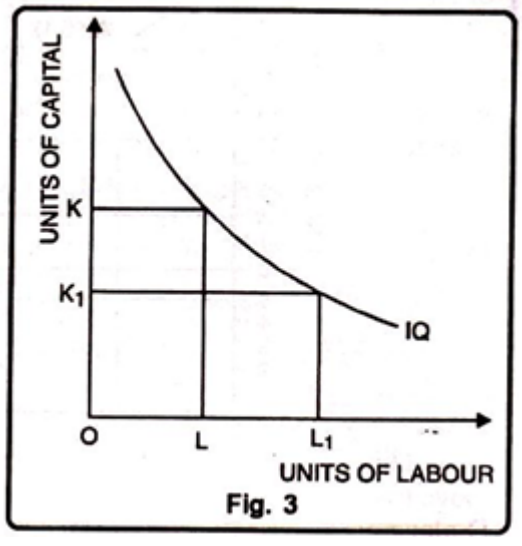

Fig. 3

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:

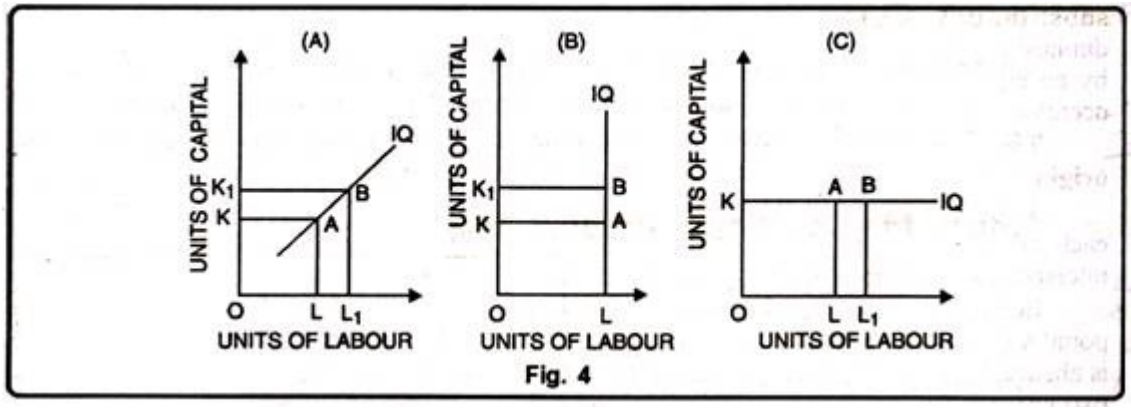

Fig. 4

(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.

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(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.

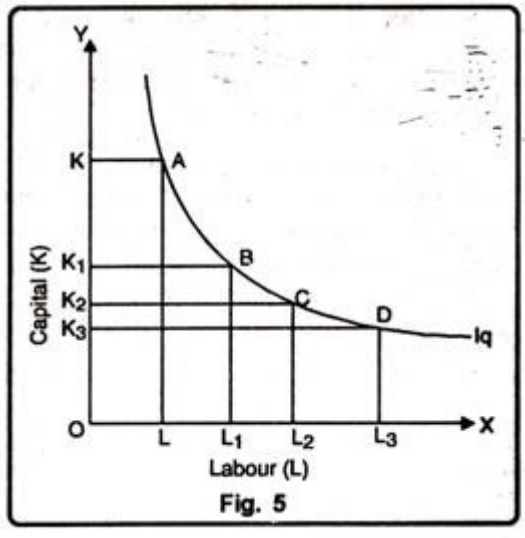

Fig. 5

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.

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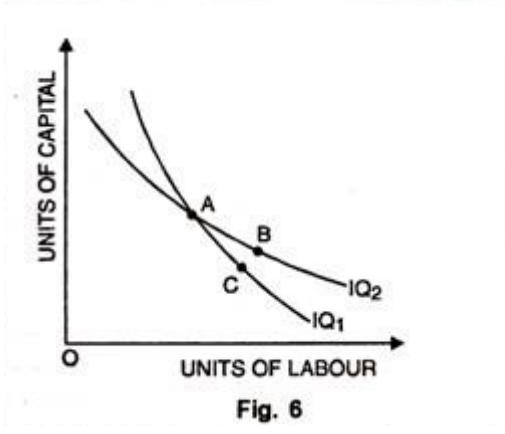

Fig. 6

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:

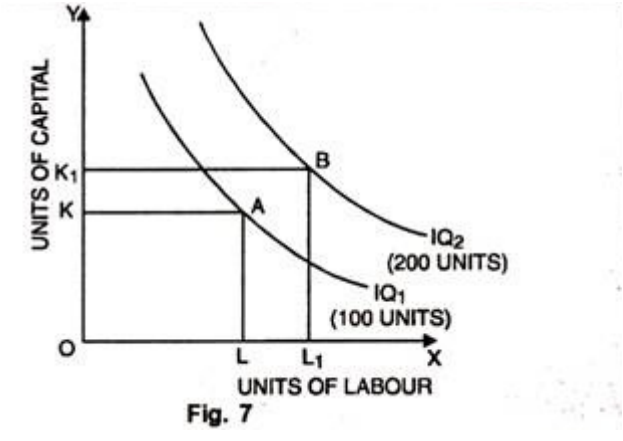

Fig. 7

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.

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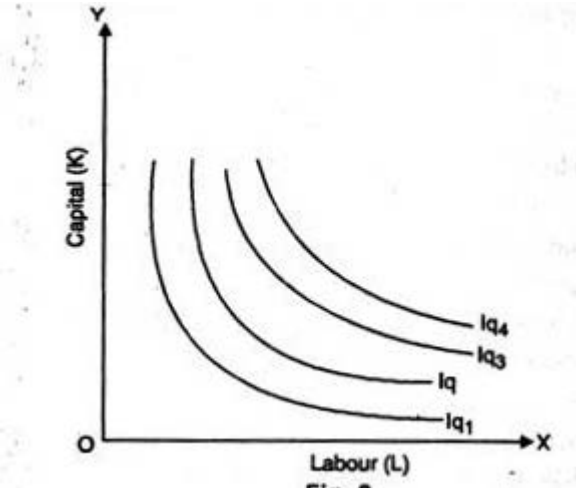

Fig. 8

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.

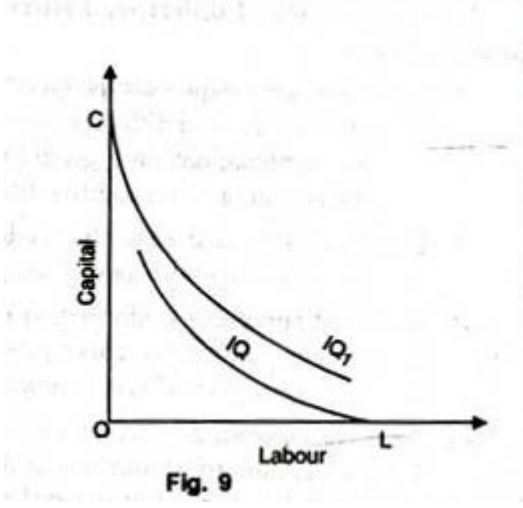

Fig. 9

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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. In Figure 10, oval shaped isoquants are shown.

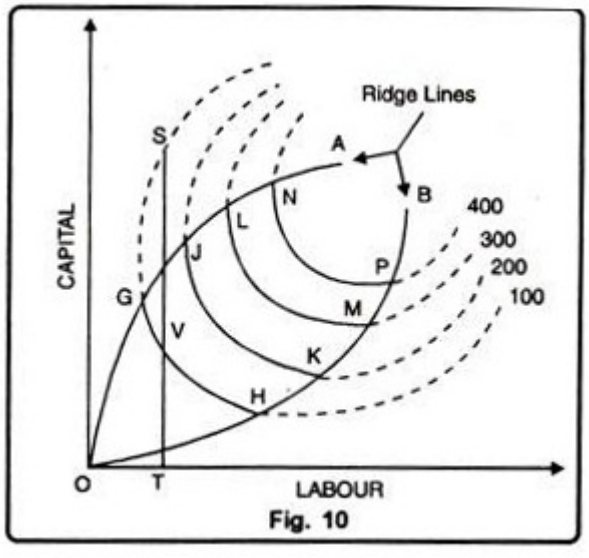

Fig. 10

Curves OA and OB are the ridge lines and in between them only feasible units of capital and labour can be employed to produce 100, 200, 300 and 400 units of the product. For example, OT units of labour and ST units of the capital can produce 100 units of the product, but the same output can be obtained by using the same quantity of labour T and less quantity of capital VT.

Thus only an unwise entrepreneur will produce in the dotted region of the iso-quant 100. The dotted segments of an isoquant are the waste- bearing segments. They form the uneconomic regions of production. In the up dotted portion, more capital and in the lower dotted portion

more labour than necessary is employed. Hence GH, JK, LM, and NP segments of the elliptical curves are the isoquants.

Optimum Use of Resources (With Diagram)| Economics

Production involves the combination of the services of the different factors, as very few economic tasks are performed by one factor alone. Thus, every productive unit, whether it be a factory or a farm or a railway, uses a number of different types of workers and equipment and other factors.

In the short run, it is usually found that the proportions between the different factors remain fixed and cannot be altered. Thus, a plant may be designed to employ a certain number of men, for example, one man to each machine.

In some cases, however, the proportion of the different factors remains more or less fixed all the time: one driver for one tax-cab, one ploughman for one plough, etc. But, the proportions are seldom absolutely fixed in the proportion of one to one, as these are subject to changes due to change in the methods of production or change in factor prices.

In the long run, the proportions between the factors can usually be varied through the substitution of factors. The relative proportion of the different factors can be varied, as for example, machinery can be substituted for labour, oil for coal and so forth.

A firm is always eager to substitute the different factors to produce a given amount of output at the lowest possible cost. It substitutes one factor for another so long such a substitution can yield the same output at lesser cost. Under a price system, this substitution depends on the relative prices (and productivity) of the different factors.

The factor, say labour, should be substituted for another factor, say capital, so long as less than a rupee worth of labour can replace a rupee’s worth of capital and still yield the same

output. In other words, if a unit of labour costs, say, two times as much as unit of capital, labour should be substituted for capital as long as a unit of labour can replace more than two units of capital and still yield the same output.

In this way, a given output will be produced at the lowest possible cost given the prices of the various factors; the combination of the factors which produces the given output at the lowest possible cost is known as the least-cost combination of factors.

Neo-classical economists like Alfred Marshall and others used to explain the factor-combination and allocation with reference to the marginal productivity of each factor and its price. Suppose, the marginal product of a factor is 150 units of output and the price of the factor is Rs 15.

Then, 150 + 15, i.e., is the additional output resulting from the marginal rupee spent on the factor. A firm varies the quantities of the different factors of production in such a view that it gets equal marginal returns from all the lines of expenditure for factors.

The condition for the least-cost combination or the optimum combination of factors in equilibrium is expressed in the following manner:

$$\frac{\text{Marginal product of factor A}}{\text{Price of A}} = \frac{\text{Marginal product of factor B}}{\text{Price of B}}$$

A firm would employ more of one factor and less of the other till the above “proportionately rule” is satisfied.

The above result can be extended to cover any number of variable factors.

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In a more general situation, the condition for the least-cost combination may be expressed as follows:

MPa/Pa = MPb/Pb = ….. = MPn/Pn

where MPa is the marginal product of factor A and Pa is the price of A, and so on. If MPa/Pa is greater than it will be to the advantage of the entrepreneur to employ more of factor A and less of factor B. He will employ more of one factor and less of the other till the above rule or the law of equi-marginal return is satisfied.

Conclusion:

The principle of least-cost combination or the law of equimarginal return plays a very important role in the theory of production. This rule is used by a profit-maximising firm to make an optimum purchase of variable factors the prices of which are taken as given.

The principle suggests that the choice of an efficient combination of variable factors depends on two things, viz., the marginal productivity of different factors and their prices. Only by making a comparison between factor prices and productivity it is possible to choose an optimum combination of resources.

The Expansion Path of a Firm

Meaning of Expansion Path:

We know that the production function of the firm

q = f(x,y)

ives us the isoquant map of the firm, one isoquant (IQ) for each particular level of output, and the cost equation of the firm

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$C = r_X x + r_Y y$ (8.54)

gives us the family of parallel iso-cost lines (ICLs), given the prices of the inputs $r_X$and r_Y, one ICL for one particular level of cost. The IQ-map and the family of ICLs have been given in Fig. 8.14. If we now join the point of origin 0 and the points of tangency, E_1, E_2, E_3, etc., between the IQs and the ICLs by a curve, then this curve (OK in Fig. 8.14) would give us what is known as the expansion path of the firm.

The expansion path is so called because if the firm decides to expand its operations, it would have to move along this path. Let us note that the firm may expand in two ways.

First, it may want to expand by successively increasing its level of cost or its expenditure on the inputs X and Y, i.e., by using more and more of inputs, and, consequently, by producing more of its output.

Second, the firm may decide to expand by increasing its level of output per period. This the firm may do by increasing the expenditure on the inputs, i.e., by using more and more of them.

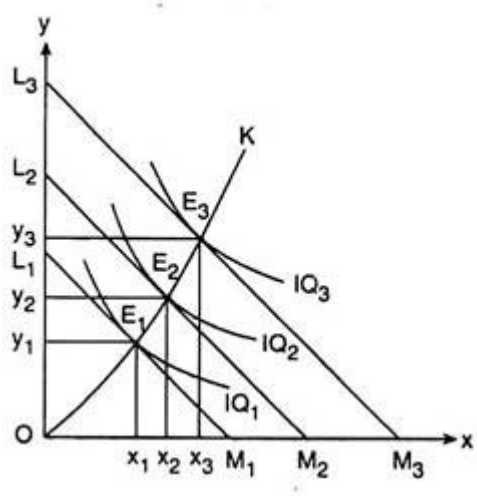

Fig. 8. 14 The expansion path of a firm

The two approaches to expansion apparently appear to be the same, for both involve an increase in expenditure. However, there is a fundamental difference. In the first case, decision is taken initially at the point of cost. Cost levels are made higher and higher and then efforts are made to maximise the level of output subject to the cost constraint.

On the other hand, in the second case, decision-making occurs initially and directly at the point of output. Here the firm first decides to produce more of output and then efforts are made to produce the output at the minimum possible cost.

Types of Expansion Path:

(a) Expansion by Means of Increasing the Level of Expenditure on the Inputs:

In Fig. 8.14, let us suppose that, initially, the firm's level of cost is such that its ICL is L_1M_1 and output-maximisation subject to cost constraint occurs at the point of tangency, E_1, between the ICL, L_1M_1, and an IQ which is IQ_1. At E_1 the firm uses X_1 of the first input and y_1 of the second input to produce the maximum possible output, say, q_1, which is represented by IQ_1.

Now, if the firm decides to expand by increasing the cost level from the level of $L_1M_1$to that of L_2M_2, then the firm would be in output-maximising equilibrium at the point of tangency E_2 (x_2, y_2), on IQ_2, using more of the inputs, $x_2 > x_1$ and $y_2 > y_1$, and producing an output level, say, q_2, $q_2 > q_1$, since IQ_2 is a higher isoquant than IQ_1.

In the same way, if the firm decides to expand further, it would increase its cost level from that of L_2M_2 to that of L_3M_3 and it would produce the maximum output subject to the cost constraint at the point of tangency E_3 (x_3, y_3) on IQ_3 using more of the inputs, $x_3 > x_2$ and $y_3 > y_2$, and producing a higher level of output, say, q_3, $q_3 > q_2$, since IQ_3 is a higher IQ than IQ_2.

The process of expansion of firm's operations through increases in the level of cost may go on in this say so long as the firm decides in its favour. If we now join the point of origin O and the points E_1, E_2, E_3, etc. by a path, then we would obtain the firm's expansion path OK in Fig. 8.14.

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That is, if the firm expands by increasing its level of cost, it would have to move successively from one equilibrium point to another along this expansion path.

We have joined the path through the equilibrium points E_1, E_2, etc. with the point of origin O, because if the firm moves backward along the expansion path by decreasing the cost level then it would be moving from the initial equilibrium point, say, E_3 to E_2, then from E_2 to E) and would approach the point O which would be the limiting point in this process.

As the firm's cost level decreases and tends to zero, the input quantities and the output quantity would all decrease and tend to zero, and thus the point of origin O would be the limiting point.

(b) Expansion by Means of Increasing the Level of Output:

In Fig. 8.14, let us suppose that initially the firm decides to produce q_1 of output which can be produced at any point on the isoquant, IQ_1. The firm would be in cost-minimising equilibrium at the point E_1 which is the point of tangency between $IQ_1$and an iso-cost line say, ICL_1. At the point E_1, the firm would use Xi and y] quantities of the two inputs and its cost amounts to, say, C_1, which is the minimum possible.

The firm may now decide to expand by increasing its level of output from q_1 to q_2 on IQ_2. If the firm makes this decision, its cost-minimising equilibrium will be obtained at the point of tangency E_2 (x_2, y_2) on L_2M_2 using more of the inputs, $x_2 > x_1$ and $y_2 > y_1$ and incurring a cost level C_2 on L_2M_2, which is the minimum possible required to produce the output of q_2. However, $C_2 > C_1$ since L_2M_2 is a higher ICL than L_2M_2.

In the same way, the firm may decide to increase again its level of output from q_2 to q_3 on IQ_3. In this case, the firm's equilibrium point would be the point of tangency $E_3(x_3, y_3)$ on the ICL, L_3M_3. At E_3, the firm would use still more of the inputs, $x_3 > x_2$and $y_3 > y_2$, incurring a cost level C_3 on L_3M_3, which is the minimum required for producing q_3 of output. However, $C_3 > C_2$ since L_3M_3 is a higher ICL than L_2M_2.

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The firm's process of expansion may go on like this as long as it decides to expand. The expansion path again would be OK that would start from the point of origin O and pass through the points E_1, E_2, E_3, etc.

If the firm decides to contract and produce less of output, then the limiting point of the process of contraction would be the point of origin O, where the firm's use of the inputs, its cost level and output would all tend to zero.

The Equation of the Expansion Path:

Each point on the expansion path like OK in Fig. 8.14, is a point of tangency between an isoquant and an iso-cost line. Therefore, at each point on the expansion path, we have numerical slope of the IQ = numerical slope of the ICL

$\Rightarrow MRTS_{X,Y} = r_X/r_Y$

$\Rightarrow f_X/f_Y = r_X/r_Y$ = constant [$\because r_X$ and r_Y are given and constant] (8.64)

Therefore, (8.64) gives us the equation of the expansion path.

isocost Line

The isocost line plays an important role in determining the combination of factors that the firm will choose for production. An isocost line is defined as locus of points representing various combinations of two factors, which the firm can buy with a given outlay. Higher isocost lines represent higher outlays (total cost) and lower isocost lines represent lower outlays.

The isocost line depends on two things :

(1) Prices of the factors of production and

(2) the total outlay, which a firm has to make on the factors of production. Given these two, the isocost line can be drawn. The slope of the isocost line is equal to the ratio of the prices of two factors. Thus the slope of the isocost line is given as

Slope of isocost line =

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$$\frac{\text{Price of factor X (Capital)}}{\text{Price of factor Y (Labour)}}$$

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Relationship between Production and Costs

The cost is closely related to production theory. A cost function is the relationship between a firm's costs and the firm's output. While the production function specifies the technological maximum quantity of output that can be produced from various combinations of inputs, the cost function combines this information with input price data and gives information on various outputs and their prices. The cost function can thus be thought of as a combination of the two pieces of information i.e., production function and input prices.

Now consider a short-run production function with only one variable input. The output grows at an increasing rate in the initial stages implying increasing retunes to the variable input, and then diminishing returns to the variable input start. Assuming that the input prices remain constant, the above production function will yield the variable cost function which has a shape that is characteristic of much variable cost function increasing at a decreasing rate and then increasing at an increasing rate.

Relationship between average product and average costs, and marginal product and marginal costs for example:

TVC = Prices of Accuring Variable Factors of Production = (Pr.V)

$$\therefore \text{AVC} = \frac{\text{TVC}}{\text{Q}} = \text{Pr}.\frac{\text{V}}{\text{Q}} = \frac{\text{Pr}}{\text{Q/V}}$$

$$\text{and MC} = \frac{\Delta \text{TC}}{\Delta \text{Q}}$$

where Pr stands for the price of the variable factor and V stands for amount of variable factor.

Private Costs versus Social Costs:

Private costs are those that accrue directly to the individuals or firms engaged in relevant activity. External costs, on the other hand, are passed on to persons not involved in the activity in any direct way (i.e., they are passed on to society at large). While the private cost to the firm of dumping is zero, it is definitely positive to the society. It affects adversely the people located down current who are adversely affected and incur higher costs in terms of treating the water for their use, or having to travel a great deal

to fetch potable water. If these external costs were included in the production costs of the producing firm a true picture of real or social costs of the output would be obtained. Ignoring external costs may lead to an inefficient and undesirable allocation of resources in society.

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You may note that Pr being given, AVC is inversely related to the average product of the variable factors. In the same way, given the wage rage, MC is inversely related to the marginal product of labor. We shall explore this relationship in greater detail subsequently.

3.3.3 Short-Run Cost Functions

During short run some factors are fixed and others are variable. The short-run is normally defined as a time period over which some factors of production are fixed and others are variable. Needless to emphasize here that these periods are not defined by some specified length of time but, rather, are determined by the variability of factors of production. Thus, what one firm may consider the long-run may correspond to the short-run for another firm. Long run and short run costs of every firms varies.

In the short-run, a firm incurs some costs that are associated with variable factors and others that result from fixed factors. The former are called variable costs and the latter represent fixed costs. Variable costs (VC) change as the level of output changes and therefore can be expressed as a function of output (Q), that is VC = f (Q). Variable costs typically include such things as raw material, labor, and utilities. In Column 3 of Table 1, we find that the total of variable costs changes directly with output. But note that the increases in variable costs associated with each one-unit increase in output are not constant. As production begins, variable costs will, for a time, increase by a decreasing amount, this is true through the fourth unit of the output. Beyond the fourth unit, however, variable costs rise by increasing amount for each successive unit of output. The explanation of this behavior of variable costs lies in the law of diminishing returns.

The following table will give you an idea about all

Table : Total and Average-Cost Schedules for an Individual Firm in the Short-Rum (Hypothetical Data in Rupees)

Total cost data, per week				Average-cost data, per week			
(1) Total Product	(2) Total Fixed Cost (TFC)	(3) Total variable cost (TVC)	(4) Total cost (TC) TC = TFC + TVC	(5) Average fixed cost (AFC) AFC = TFC/Q	(6) Average variable cost (AVC) AVC = TVC/Q	(7) Average total cost (ATC) ATC = TC/Q	(8) Marginal cost (MC) MC = change in TC change in Q

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0	100	0	100				
1	100	90	190	100.00	90.00	190.00	90
2	100	170	270	50.00	85.00	135.00	80
3	100	240	340	33.33	80.00	113.33	70
4	100	300	400	25.00	75.00	100.00	60
5	100	370	470	20.00	74.00	94.00	70
6	100	450	550	16.67	75.00	91.67	80
7	100	540	640	14.29	77.14	91.43	90

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8	100	650	750	12.50	81.25	93.75	110
9	100	780	880	11.11	86.25	97.78	130
10	100	930	1030	10.00	86.67	103.00	150
					93.00		

Total Cost: Total cost is the sum of fixed and variable cost at each level of output. It is shown in column 4 of Table-1. At zero unit of output, total cost is equal to the firm's fixed cost. Then for each unit of production (through 1 to 10), total cost varies at the same rate as does variable cost.

Per Unit, or Average Costs: Besides their total costs, producers are equally concerned with their per unit, or average costs. In particular, average cost data is more relevant for making comparisons with product price,

Average Cost:
AC =TC/Q
Where TC =total cost;
AC = average cost
Q = quantity

Average Fixed Costs: Average fixed cost (AFC) is derived by dividing total fixed cost (TFC) by the corresponding output (Q). That is

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

While total fixed cost is, by definition, independent of output, AFC will decline so long as output increases. As output increases, a given total fixed cost of Rs. 100 is obviously being spread over a larger and larger output. This is what business executives commonly refer to as 'spreading the overhead'. We find in Figure-III that the AFC curve is continuously declining as the output is increasing. The shape of this curve is of an asymptotic hyperbola.

Average Variable Costs: Average variable cost (AVC) is found by dividing total variable cost (TVC) by the corresponding output (Q):

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

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Q

AVC declines initially, reaches a minimum, and then increases again,

AFC + AVC = ATC

$$\frac{\Delta \text{ ATC}}{\Delta \text{ Q}} = \text{MC}$$

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ΔQ

Average Total Costs

Average total cost (ATC) can be found by dividing total cost (TC) by total output (Q) or, by adding AFC and AVC for each level of output. That is:

$$ATC = \frac{TC}{Q} = AFC + AVC$$

Marginal Cost

Marginal cost (MC) is defined as the extra, or additional, cost of producing one more unit of output. MC can be determined for each additional unit of output simply by noting the change in total cost which that unit's production entails:

$$MC = \frac{\text{Change in TC}}{\text{Change in Q}} = \frac{\Delta TC}{\Delta Q}$$

The marginal cost concept is very crucial from the manager's point of view. Marginal cost is a strategic concept because it designates those costs over which the firm has the most direct control. More specifically, MC indicates those costs which are incurred in the production of the last unit of output and therefore, also the cost which can be "saved" by reducing total output by the last unit. Average cost figures do not provide this information. A firm's decisions as to what output level to produce is largely influenced by its marginal cost. When coupled with marginal revenue, which indicates the change in revenue from one more or one less unit of output, marginal cost allows a firm to determine whether it is profitable to expand or contract its level of production.

Relationship of MC to AVC and ATC: It is also notable that marginal cost cuts both AVC and ATC at their minimum when both the marginal and average variable costs are falling, average will fall at a slower rate. And when MC and AVC are both rising, MC will rise at a faster rate. As a result, MC will attain its minimum before the AVC. In other words, when MC is less than AVC, the AVC will fall, and when MC exceeds AVC, AVC will rise. This means that so long as MC lies below AVC, the latter will fall and where MC is above AVC, AVC will rise. Therefore, at the point of intersection where MC=AVC, AVC has just ceased to fall and attained its minimum, but has not yet begun to rise. Similarly, the marginal cost curve cuts the average total cost curve at the latter's

minimum point. This is because MC can be defined as the addition either to total cost or to total cost or to total variable cost resulting from one more unit of output. However, no such relationship exists between MC and the average fixed cost, because the two are not related; marginal cost by definition includes only those costs which change with output and fixed costs by definition are independent of output.

Managerial Uses of the Short-Run Cost Concepts: As already emphasized the relevant costs to be considered for decision-making will differ from one situation to the other

depending on the problem faced by the manager. In general, the total cost concept is quite useful in finding out the break-even quantity of output. The total cost concept is also used to find out whether firm is making profits or not. The average cost concept is important for calculating the per unit profit of a business firm. The marginal and incremental cost concepts are essential to decide whether a firm should expand its production or not.

3.3.4 Long-Run Cost Functions

Long-run total costs curves are derived from the long-run production functions in which all inputs are variable. Such a production function is represented by the five asquint curves showing five different levels of output. The five cost curves tangent to these is equates at the points A, B, C, D and E represent total cost on resources. Since the cost per unit of capital (v) and, labor (w) are assumed to be constant, these five cost curves are parallel to one another, and the distance between them is constant along the expansion path traced out by A, B, C, D and E.

Unit Costs in the Long-Run: In the long-run, costs are not divided into fixed and variable components; all costs are variable. Thus, the only long-run unit cost functions of interest are long-run average cost (LAC) and long-run marginal cost (LMC). These are defined as follows:

$$LAC = \frac{LTC}{Q} \; ; \quad LMC = \frac{\Delta LTC}{\Delta Q} \; ; \quad LMC = \frac{d(LTC)}{dQ}$$

For the long-run total cost, these unit costs can be presented in tabular form as follows:

Output Q	Long Run Total Cost (LTC)	Long Run Average Cost (LAC)	Long Run Marginal Cost (LMC)
0	0	--	--
50	150	3.00	3.00
125	200	1.60	0.67
250	250	1.00	0.67
300	300	1.00	1.00
325	350	1.08	2.00

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3.4 PRODUCTION CONCEPT AND ANALYSIS

The basis function of a firm is that of readying and presenting a product for sale-presumably at a profit. Production analysis related physical output to physical units of factors of production. In the production process, various inputs are transformed into some form of output. Inputs are broadly classified as land, labor, capital and entrepreneurship (which embodies the managerial functions of risk taking, organizing, planning, controlling and directing resources). In production analysis, we study the least-cost

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combination of factor inputs, factor productivities and returns to scale. Here we shall introduce several new concepts to understand the relationship involved in the production process. We are concerned with economic efficiency of production which refers to minimization of cost for a given output level. The efficiency of production process is determined by the proportions in which various inputs are used, the absolute level of each input and productivity of each input at various levels. Since inputs have a cost attached, the degree of efficiency in production gets translated into a level of costs per units of output.

Why to Study Production?

When making the decision of what to produce and what not to produce, the study of production is needed. The discussion in this lesson covers decision rules for determining the quantity of various inputs to produce a firm's output under different circumstances. It also develops a basis upon which firm's costs can be constructed. After all, a firm incurs costs because it must pay for productive factors. Thus an understanding of production helps provide a foundation for the study of cost. Business firms produce goods or service as a means to an end. Besides meeting of final consumer needs, the end objective of a firm may be to maximize profits, to gain or maintain market share, to achieve a target return on investment, or any combination there of. In case of public goods, the objective may be to provide a particular service, such as education and health, within the bounds of a budget constraint. In other words, a firm attempts to combine various inputs in such a way that minimum resources are committed to produce a given product or that maximum production results from a given input. To achieve this, persons in the decision-making position should have a basis understanding of the process of production, and also the time perspective of production.

3.4.1 Production Function

A production function expresses the technological or engineering relationship between the output of product and its inputs. In other words, the relationship between the amount of various inputs used in the production process and the level of output is called a production function. Traditional economic theory talks about land, labor, capital and organization or management as the four major factors of production. Technology also contributes to output growth as the productivity of the factors of production depends on the state of technology. The point which needs to be emphasized here is that the production function describes only efficient levels of output; that is the output associated with each combination of inputs is the maximum output possible, given the existing level of technology. Production function changes as the technology changes.

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Production function is represented as follows: Q=f (f1, f2……..f n); Where f1, f2,…..fn are amounts of various inputs such as land, labor, capital etc., and Q is the level of output for a firm. This is a positive functional relationship implying that the output varies in the same direction as the input quantity. In other words, if all the other inputs are held constant, output will go up if the quantity of one input is increased. This means that the partial derivative of Q with respect to each of the inputs is greater than zero. However, for a reasonably good understanding of production decision problems, it is convenient to work with two factors of production. If labor (L) and capital (K) are the

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only two factors, the production function reduces to: Q=f (K, L). From the above relationship, it is easy to infer that for a given value of Q, alternative combinations of K and L can be used. It is possible because labor and capital are substitutes to each other to some extent. However, a minimum amount of labor and capital is absolutely essential for the production of a commodity. Thus for any given level of Q, an entrepreneur will need to hire both labor and capital but he will have the option to use the two factors in any one of the many possible combinations. For example, in an automobile assembly plant, it is possible to substitute, to some extent, the machine hours by man hours to achieve a particular level of output (no. of vehicles). The alternative combinations of factors for a given output level will be such that if the use of one factor input is increased, the use of another factor will decrease, and vice versa.

3.4.2 Isoquants

Isoquants are a geometric representation of the production function. It is also known as the Iso Product curve. As discussed earlier, the same level of output can be produced by various combinations of factor inputs. Assuming continuous variation in the possible combination of labor and capital, we can draw a curve by plotting all these alternative combinations for a given level of output. This curve which is the locus of all possible combinations is called Isoquants or Iso-product curve. Each Isoquants corresponds to a specific level of output and shows different ways all technologically efficient, of producing that quantity of outputs. The Isoquants are downward slopping and convex to the origin. The curvature (slope) of an Isoquants is significant because it indicates the rate at which factors K&L can be substituted for each other while a constant level of output of maintained. As we proceed north-eastward from the origin, the output level corresponding to each successive isoquant increases, as a higher level of output usually requires greater amounts of the two inputs. Two Isoquants don't intersect each other as it is not possible to have two output levels for a particular input combination.

Marginal Rate if Technical Substitution: It can be called as MRTS. MRTS is defined as the rate at which two factors are substituted for each other. Assuming that 10 pairs of shoes can be produced in the following three ways.

Q	K	L
10	8	2
10	4	4
10	2	8

We can derive the MRTS between the two factors by plotting these combinations along a curve (Isoquant).

Measures of Production: The measure of output represented by Q in the production function is the total product that results from each level of input use. For example, assuming that there is only one factor (L) being used in the production of cigars, total output at each level of labor employed could be:

Labor (L)	Output(Q)	Labor(L)	Output(Q)
1	3	8	220
2	22	9	239
3	50	10	246
4	84	11	238
5	121	12	212
6	158	13	165
7	192	14	94

The total output will be 220 cigars if we employed 8 units of labor. We assume in this example, that the labor input combines with other input factors of fixed supply and that the technology is a constant. In additional to the measure of total output, two other measures of production i.e. marginal product and average product, are important to understand.

3.4.3 Total, Average and Marginal Products

This has reference to the fundamental concept of marginalize. From the decision making point view, it is particularly important to know how production changes as a variable input are changed. For example, we want to know if it would be profitable to hire an additional unit of labor for some additional unit of labor for some additional productive activity. For this, we need to have a measure of the rate of change in output as labor is increased by one unit, holding all other factors constant. We call this rate of change the marginal product of labor. In general, the marginal product (MP) of a variable factor of production is defined as the rate of change in total product (TP or Q). Here the output doesn't increase at constant rate as more of any one input is added to the production process. For example, on a small plot of land, you can improve the yield by increasing the fertilizer use to some extent. However, excessive use of fertilizer beyond the optimum quantity may lead to reduction in the output instead of any increase as per the Law of Diminishing Returns. (For instance, single application of fertilizers may increase the output by 50 per cent, a second application by another 30 per cent and the third by 20 per cent. However, if you were to apply fertilizer five to six times in a year, the output may drop to zero).

Average Product: Often, we also want to know the productivity per worker, per kilogram of fertilizer, per machine, and so on. For this, we have to use another measure of production: average product. The average Product (AP) of a variable factor of production is defined as the total output divided by the number of units of the variable

factor used in producing that output. Suppose there are factors (X1, X2…….Xn), and the average product for the ith factor is defined as: APi = TP/Xi. This represent the mean (average) output per unit of land, labor, or any other factor input. The concept of average product has several uses. For example, whenever inter-industry comparisons of labor productivity are made, they are based on average product of labor. Average productivity of workers is important as it determines, to a great extent, the competitiveness of one's products in the markets.

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Marginal Average and Total Product: A hypothetical production function for shoes is presented in the Table below with the total average, the marginal products of the variable factor labor. Needless to say that the amount of other inputs and the state of technology are fixed in this example.

Labor Input (L)	Total Output (TP) (AP = TP/L)	Average Products MP = $\frac{\Delta TP}{\Delta L}$	Marginal Product
0	0	0	0
1	14	14	14
2	52	26	38
3	108	36	56
4	176	44	68
5	250	50	74
6	324	54	74
7	392	56	68
8	448	56	56
9	486	54	38
10	500	50	14
11	484	44	-16
12	432	36	-52
13	338	26	-94
14	196	14	-142

The value for marginal product is written between each increment of labor input because those e values represent the marginal productivity over the respective intervals. In both the table and the graphic representation, we see that both average and marginal products first increase, reach the maximum, and eventually decline. Note that MP=AP at the maximum of the average product function. This is always the case. If MP>AP, the average will be pushed up by the incremental unit, and if MP<AP, the average will be pulled down. It follows that the average product will reach its peak where MP=AP.

Economies of Scale

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'Economies' mean advantages. Scale refers to the size of unit. 'Economies of Scale' refers to *the cost advantages due to the larger size of production.* As the volume of production increases, the overhead cost will come down. The bulk purchase of inputs will give a better bargaining power to the producer which will reduce the average variable cost too. All these advantages are due to the large scale production and these advantages are called economies of scale.

There are two types of economies of scale

a) Internal economies of scale; b) External economies of scale

a) internal Economies of Scale

'Internal economies of scale' are the advantages enjoyed within the production unit. These economies are enjoyed by a single firm independently of the action of the other firms. For instance, one firm may enjoy the advantage of good management; another may have the advantage of more up-to-date machinery. There are five kinds of internal economies. They are

1. ***Technical Economies:*** As the size of the firm is large, the availability of capital is more. Due to this, a firm can introduce up- to-date technologies; thereby the increase in the productivity becomes possible. It is also possible to conduct research and development which will help to increase the quality of the product.
2. ***Financial Economies:*** It is possible for big firms to float shares in the market for capital formation. Small firms have to borrow capital whereas large firms can buy capital.
3. ***Managerial Economies:*** Division of labour is the result of large scale production. Right person can be employed in the right department only if there is division of labour. This will help a manager to fix responsibility to each department and thereby the productivity can be increased and the total production can be maximised.
4. ***Labour Economies:*** Large Scale production paves the way for division of labour. This is also known as specialisation of labour. The specialisation will increase the quality and ability of the labour. As a result, the productivity of the firm increases.
5. ***Marketing Economies:*** In production, the first buyer is the producer who buys the raw materials. As the size is large, the quantity bought is larger. This gives the producer a better bargaining power. Also he can enjoy credit facilities. All these

are possible because of large scale production. Buying is the first function in marketing.

6. ***Economies of survival:*** A large firm can have many products. Even if one product fails in the market, the loss incurred in that product can be managed by the profit earned from the other products.

b)External economies of scale

When many firms expand in a particular area – i.e., when the industry grows – they enjoy a number of advantages which are known as external economies of scale. This is not the advantage enjoyed by a single firm but by all the firms in the industry due to the structural growth. They are

a) Increased transport facilities b)

Banking facilities

c) Development of townships

d) Information and communication development

All these facilities are available to all firms in an industrial region.

Diseconomies of Scale

The diseconomies are the disadvantages arising to a firm or a group of firms due to large scale production.

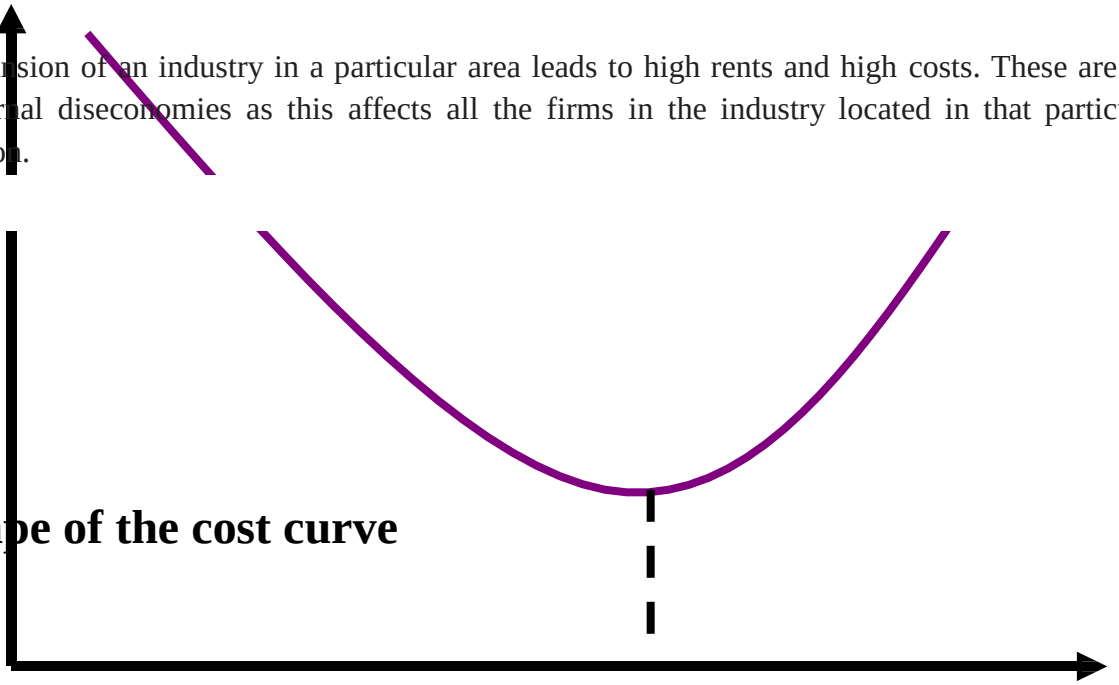
Internal Diseconomies of Scale

If a firm continues to grow and expand beyond the optimum capacity, the economies of scale disappear and diseconomies will start operating. For instance, if the size of a firm increases, after a point the difficulty of management arises to that particular firm which will increase the average cost of production of that firm. This is known as internal diseconomies of scale.

External Diseconomies of Scale

Beyond a certain stage, too much concentration and localisation of industries will create diseconomies in production which will be common for all firms in a locality. For instance, the

expansion of an industry in a particular area leads to high rents and high costs. These are the external diseconomies as this affects all the firms in the industry located in that particular region.



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Quantity

Defining Economies of Scope

- Economies of scope = cost savings when different goods/services are produced "under one roof"

  $TC(Q_x,Q_y) < TC(Q_x,0) + TC(0,Q_y)$

  i.e. Firm's total cost of producing X and Y together is lower than cost of producing X and Y separately

  Difficult to illustrate graphically

Learning Curve

- Similar concept to economies of scale and scope, but not identical
- Idea is that firms learn by doing
- Firms become more efficient as they become more experienced – Learning economies depend on cumulative output rather than the rate of output

Learning Curve

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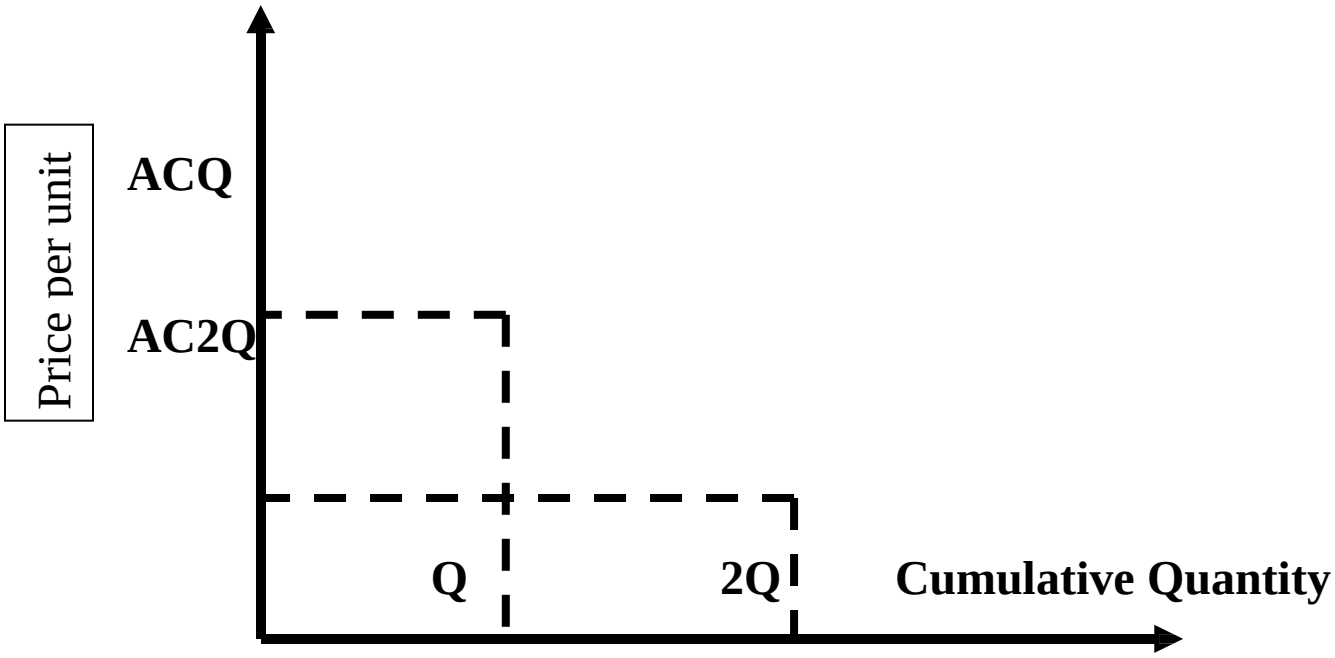

- If firms have learning curves, then they should expand output rapidly to benefit from the learning curve and achieve a cost advantage

- This strategy is not as profitable in the short run but will lead to larger profits in the long run

Learning Curve – Example

- Consider a successful business person who wants to "retire" and open a winery
- He thinks he knows a lot about the wine business but in fact he knows little

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- But he is a shrewd business person and quickly learns how best to make and sell his wine
- Therefore, his per-bottle costs may decrease as he produces more wine

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UNIT –III

Perfect Competition

A perfect competition is a market situation which is having the following characteristics:

- Many buyers and sellers exist that no one can influence the price.
- All firms sell identical products or are perceived so by the buyers.
- All resources and inputs like materials, labor and capital are perfectly mobile so that firms can enter the market and fold up shop as and when 'they wish.
- Members in the market have, perfect knowledge; decisions are made as if everything was certain.

Why such market structures have been theoretically studied?

This is so because the analysis of such situations gives insights into the efficiency of resource use. It is used as a yardstick for measuring efficient allocation of resources. To the extent real world markets deviate from this ideal case we get an idea about the inefficiency of resource use prevailing in them. Apart from the efficiency aspect, the analysis of perfect competition illuminates several basic principles underlying business behavior. It is therefore useful to study this market structure in some detail.

Short-run Equilibrium

In the short-run firms cannot increase their production capacities because it takes time to arrange for resources to do so. The industry demand and supply operate in a ' market where processes similar10 an auction are in force. At the intersection of the falling demand curve and the rising supply curve the market price of a commodity for, that particular period is settled. Being too small in re1ation to the total industry's, output every individual firm and the buyer have to accept this price can be seen that at price P and quantity Q the industry's equilibrium is established. If the price were higher than P,

excess supply would come in forcing it downwards. Conversely if it were lower than P excess demand would prevail pushing it up. For an individual firm, the quantity Q that it would offer to the market will depend on its objectives and the cost conditions: Market price being given; the firm is confronted with a horizontal demand curve at the height P. 'Since all the output can be sold at P, ' an extra unit of output can be sold at the same price. Thus, for the firm, the demand curve and the average revenue curve are identical.

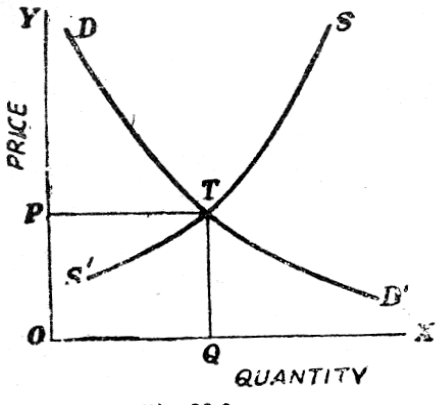

Fig 4.2 Short-run Equilibrium

We therefore have Maximum profits will be obtained at the output rate where marginal cost MC equals marginal revenue MR. This has to be so. because if the cost of producing an additional unit is less than what it can fetch in the market, then profits can be improved by producing and selling it. If; however, it costs more to produce that .additional unit than what it earns, the firm would be better off by not producing it Thus, when MC=MR, the firm is in equilibrium producing an output Q_1. It has been assumed that the firm is confronted with a U shaped cost curve. The firm takes the market price P

Supply Curves: We have just seen that a profit maximizing firm will produce that quantity at which the marginal cost equals the price. Suppose in a particular short period the market price is lower than the profit maximizing level. What will the firm do in such

a situation? Since the firm is a price-taker, will it just accept the consequences? Its response will depend on how low the price is. If it is so low that the firm is unable to recover it's variable costs, it will simply stop production and incur a loss equal to its fixed costs since these cannot be escaped. The crucial point for the firm to run the show in the short run is to recover its variable costs. This gives us the following result.

In the short-run, the supply curve of a firm in a perfectly competitive market will correspond to that portion of the marginal cost curve that lies above the average variable cost curve. As long as the price exceeds average variable cost, every unit of output provides some profit contribution which can be applied to cover fixed costs and earn some profit. The point at which the price just covers the average variable cost is known as the "shut down point" implying if price drifts below that point; the firm will stop production in the short-run. In the long-run where all costs are variable, price does cover AC= A VC=MC at the point of perfectly competitive equilibrium.

Long Run Industry Supply Curve.

The long run supply curve of a competitive industry is not obtained in the same way as the short run industry supply curve. In other words, simply by aggregating individual firm's long run MC curves one cannot obtain long run industry supply curve. The procedure of deriving the long run industry supply curve is different since, in the long run, entry into and exit of firms from the industry come into action.

A competitive firm in the long run produces at that point where the long run MC curve intersects the long run AC curve at the lowest point (i.e., P = AR = MR = LMC = minimum point of LAC). Thus, in the long run, a competitive firm operates its plant size optimally and efficiently.

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In the long run, the supply of a commodity is determined by the minimum point of long run AC curve where optimum output is obtained. This results in a change not only in the size of the industry, but also in the supply of output. The change in scale of production in the long run brings about (external) economies and (external) diseconomies of production.

Long run industry equilibrium depends on such economies and diseconomies. That is why variation in cost occurs in a competitive industry in the long run. In other words, as industry output expands in the long run, a perfectly competitive industry may experience constant cost or decreasing or increasing cost.

How wills the long run AC curve of an individual firm shift as industry output expands depends on whether the industry operates under constant cost condition, or increasing cost condition, or decreasing cost condition. Consequently, the shapes of the long run industry supply curve will be horizontal, increasing, and decreasing—depending on the cost condition on which the industry operates.

A constant cost industry is one where cost structure of the individual firm remains stable as the industry expands its output. Prices of inputs employed by a constant cost industry do not change.

An increasing cost industry is one where cost of the individual firms rises as the industry expands its output. Here prices of inputs rise.

A decreasing cost industry is one where the expansion of output causes costs to decline.

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Under decreasing cost condition, prices of inputs decline.

Constant Cost Industry and the Horizontal Supply Curve:

A constant cost industry is one where expansion or contraction of the industry does not bring about a change in the prices of factors of production employed by it. Or, a constant cost industry may be defined as one where external economies and external diseconomies balance each other.

Expansion of a constant cost industry does create neither external economies nor external diseconomies. Consequently, cost stays at the same level as industry expands. Under constant cost industry, no matter how many firms leave or join the industry, every firm will retain the same set of cost curves (LAC and LMC) with which it started.

Fig. 4.6 demonstrates long run equilibrium of an industry operating under constant cost condition. Panel (a) of t

The figure shows long run equilibrium of a competitive firm while panel (b) describes industry equilibrium determined by the intersection of demand and supply curves.

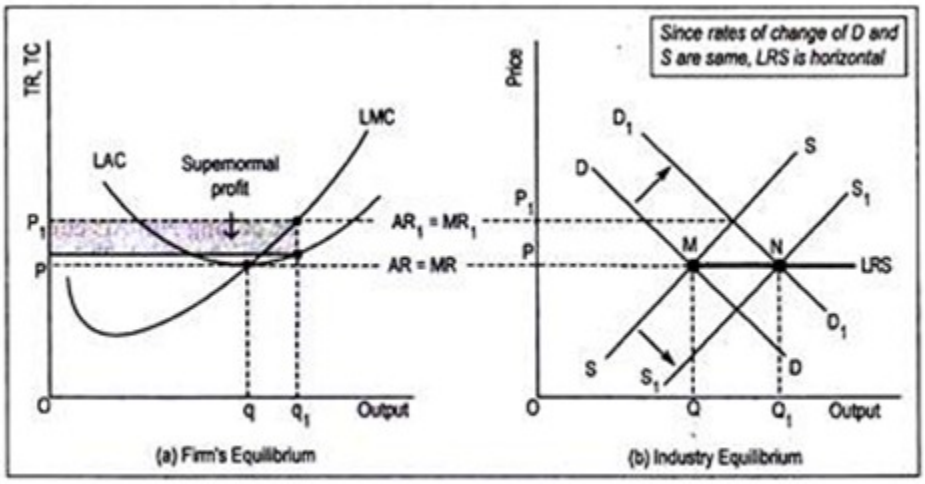

Fig. 4.6: Horizontal Supply Curve

Let us assume that DD and SS are the initial demand and supply curves. These two curves together determine (point TVF) equilibrium price at OP. Accepting this price, a typical firm would produce OQ output. Incidentally, all the firms are making zero economic profit since P = LMC = LAC.

If we assume that there are 10,000 identical firms in the industry, then the industry output would be Oq × 10,000 firms = OQ (shown in panel b). Since these firms are making only normal profit at the price OP, the industry is in equilibrium with an output OQ.

Producer Surplus

Definition

A potential seller's **cost** is the lowest price at which he or she is willing to sell a good.

Individual producer surplus is the net gain to a seller from selling a good. It is equal to the difference between the price received and the seller's cost.

Total producer surplus in a market is the sum of the individual producer surpluses of

all the sellers of a good.

We will see that the total producer surplus is the **area under the market**

Producer's surplus in the short-run for a firm.

The producer's surplus of a firm is the sum over all units of production of the difference between the market price and the MC of production.

Thus, just as the consumer's surplus measures the area below the demand curve of an individual and above the market price, producer's surplus measures the area above a producer's supply curve and below the market price.

Fig. 8.10 illustrates the producer's surplus for a firm. The profit-maximising output is q*, where P – MC. Producer's surplus is given by the area ABCD — under the demand curve and above the MC curve, from zero output to the profit-maximizing output q*.

Alternatively, it can be defined as the difference between the firm's revenue and its total variable costs (TVC) which is represented by the area ABCD = Revenue OABq* – Variable Cost (ODCq*).

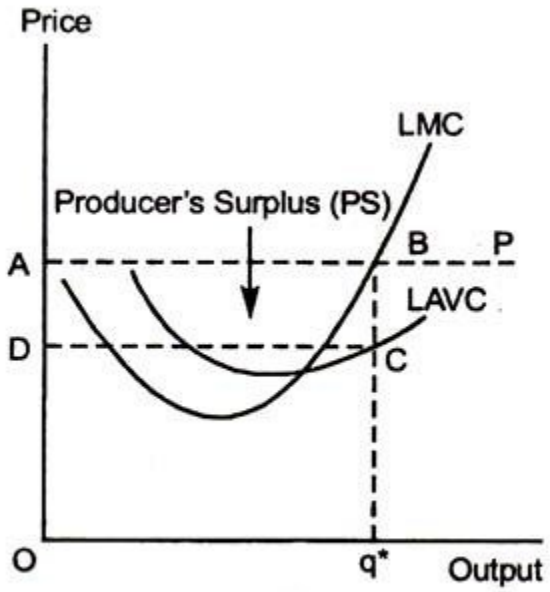

Fig. 8.10 : Producer's Surplus in the Short-run

Producer's surplus is related to profit, but is not equal to it. Producer's surplus subtracts only variable costs from revenues, while profit subtracts both variable and fixed costs. PS = TR – TVC and Profit – π-TR- TVC – TFC. Thus, producer's surplus is always greater than profit.

The extent to which firms enjoy PS depends on their costs of production. Higher-cost firms have less PS than low-cost firms. By adding up all the individual firm's producer's surplus, we can find the PS for a market. In Fig. 8.11, the market PS is obtained by the area below the market price and above the market supply curve, between O and output Q*.

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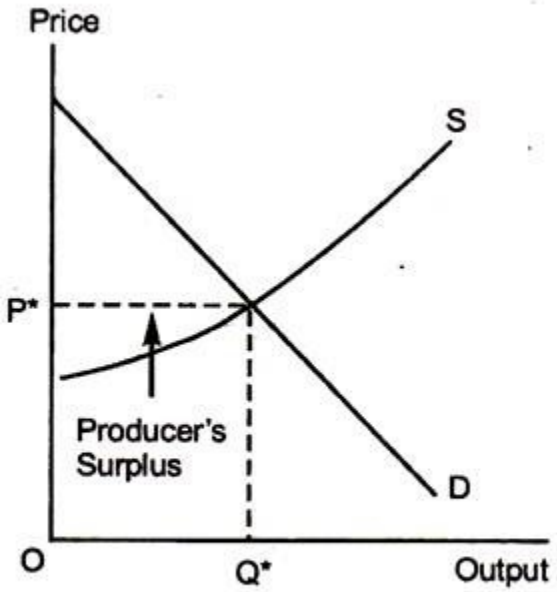

Fig. 8.11 : Producer's Surplus in the Long-run

Definition of Stability Analysis:

In Fig. 4.1, the market equilibrium is obtained at the point E_0 (p_0, q_0). Suppose now that the market is disturbed by a rightward shift of the demand curve from D_0D_0 to D_1D_1. Because of this disturbance, quantity demanded (q^d) becomes larger by the amount E_0T than the quantity supplied (q^s) at the initial equilibrium price p_0, and an adjustment process would begin.

In the analysis of stability, only consider whether the adjustment process would take the market to a new equilibrium or not.

For example, in Fig. 4.1, as the demand curve shifts and as q^dbecomes larger than q^s at $p = p_0$, the buyers would raise their bids and price would be moving up, and, as this happens, demand would be decreasing along the D_1D_1 curve from the point T to the point $E_1$and supply would be increasing along the S_0S_0 curve from the point E_0 to the point E_1.

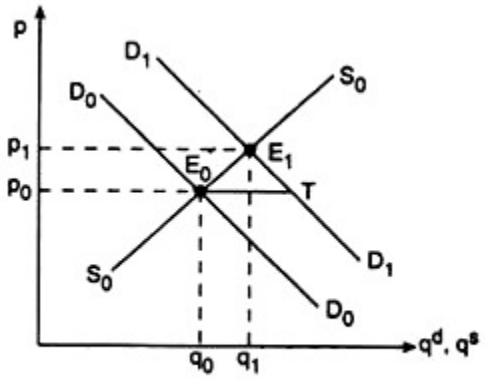

Fig. 4.1 Static stability

The point E_1 (p_1q_1)being the point of intersection between the demand curve, D_1D_1 and the supply curve, S_0S_0, would be the new equilibrium point. If, because of a disturbance on the demand side or supply side of the market, the market moves (does not move) from an initial equilibrium to a new equilibrium, then it can be said that the equilibrium is stable (unstable) in the static sense.

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State marshallian and walrasian stability condition of market equilibrium.Do you think that existence of Marshallian stability necessarily ensures walrasian stability and vice versa? Explain.

Equilibrium is said to exist in a market when forces of demand balance forces of supply.

Application of Demand and Supply Analysis

The following points highlight the top six applications of demand supply analysis. The applications are: 1. An Excise or Per Unit Tax 2. A Sales Tax 3. A Production Subsidy 4.Import Tariffs 5. Export Subsidies 6. Controls on Prices and Quantities.

Application # 1. An Excise or Per Unit Tax:

An excise or per unit tax is a fixed amount of tax, say, t, imposed on each unit of production of a commodity. The effect of a per unit tax of t on the market equilibrium of the commodity is illustrated with the help of Fig. 1.18.

If such a tax is imposed, the sellers would shift the burden of the tax on to the buyers, so that, at the equilibrium quantity, we would have: the demand price of the buyers = the supply price of the sellers + the tax (t).

or, the demand price – supply price = t … (i)

or, the demand price = supply price + t … (ii)

or, the supply price = demand price −t … (iii)

Corresponding to (i), (ii) and (iii), it will have three ways depicted in Fig. 1.17 in which the effect of the imposition of a per unit tax on market equilibrium is illustrated. In all these figures, DD and SS are the demand and supply curves of the good, and p_0 and q_0 are the equilibrium price and quantity before the imposition of the tax that are obtained at the point of intersection E between the DD and SS curves.

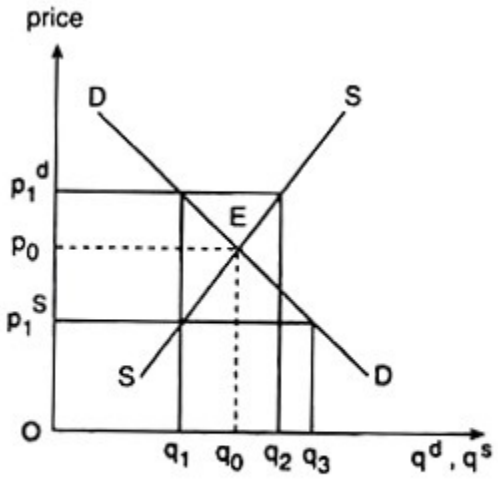

Fig. 1.17 Market equilibrium interms of demand price and supply price

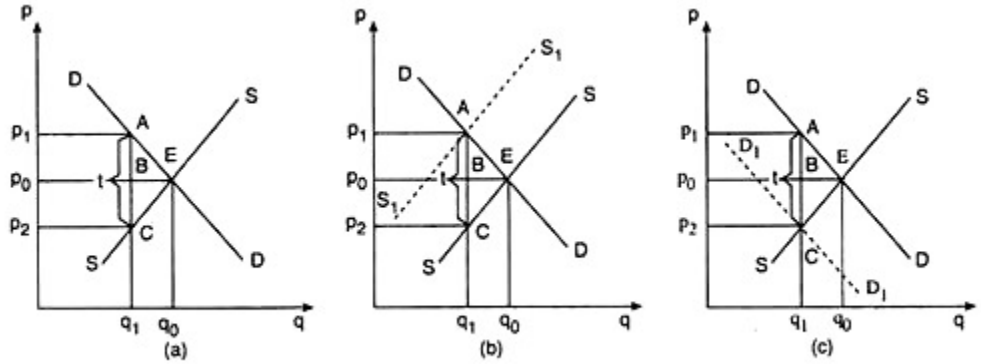

Fig. 1.18 Effects of an excise (per unit) tax upon demand-supply equilibrium

According to (i), the equilibrium quantity, after the imposition of the tax, would be that q at which the difference between the demand price and supply price would be equal to t. This case has been illustrated in part (a) of Fig. 1.18. As it is known, at any q, demand price is obtained along the demand curve and the supply price is obtained along the supply curve.

Therefore, the new equilibrium q after the imposition of the tax would be one at which the vertical gap between the DD and SS curves would be equal to t. In Fig. 1.18(a), this equilibrium output has been obtained as q_1.

At $q = q_1$ the price including the tax that the buyers would have to pay is p_{15} and the sellers, after deducting the tax from pi, would get a price of p_2 which is the supply price at $q = q_1$. At price p_1, the buyers are demanding the quantity q_1 and, at price p_2, the sellers are also supplying the quantity q_1, and so there is equilibrium and none of the buyers and sellers would tend to change the situation.

The second way of illustrating the effects of the imposition of a per unit tax upon the market equilibrium. According to (ii), at the post-tax equilibrium point, demand price would be equal to supply price +1.

Now, at any q, demand price would be obtained along the DD curve, but the supply price +1 would be obtained along a curve like S_1S_1 in Fig. 1.17(b) which is parallel to the SS curve but vertically above this curve by the distance t. The new post- tax equilibrium point would be obtained at the point of intersection A between the DD and S_1S_1curves.
Here the equilibrium quantity would be qi and the price that the buyers would pay would be pi and the price that the sellers would receive would be p_2. In this situation, both the buyers and sellers would remain satisfied.

It is evident from the Figs. 1.17(a and b) that the post-tax equilibrium solutions are identical in both the cases—owing to the imposition of the tax, the equilibrium point would move from the point E to the point A.

Lastly, the third way of illustrating the effects of the imposition of a per unit tax has been shown in Fig. 1.17(c). According to (iii), at the post-tax equilibrium point, the supply price would be the (demand) price of the good minus the amount of tax (t).

That is why, in the figure, a curve D_1D_1 is drawn, which is parallel to DD but lies below the latter at a vertical gap equal to t. In this case, the post-tax equilibrium would be obtained at the point of intersection, C, between the D_1D_1 and SS curves.
This equilibrium solution would be the same as obtained in the previous two cases—here the equilibrium output is qi and the price (that the buyers pay) is pi and the sellers receive

their desired price p_2. All are satisfied with this solution. The equilibrium point in this case would move from the point E to the point C.

If the post-tax equilibrium is compared with the pre-tax equilibrium, it is found that:

(i) After the imposition of the tax, equilibrium quantity bought and sold has decreased from q_0 to q_1.

(ii) The equilibrium price including the tax that the buyers would pay is p_1 which is greater than the pretax (equilibrium) price p_0, but not by the amount (t) of the tax.

(iii) Although the sellers have shifted the burden of the tax on to the buyers and although the buyers are paying a price which includes the tax, the entire burden of the tax, in fact, has not shifted to the buyers.

At the pre-tax equilibrium point, for both the buyers and sellers, the price was $p = p_0$. But, after the tax, the buyers are paying AB more as the price and the sellers are getting BC less as the price, AB + BC = AC being equal to t.

(iv) In respect of quantity also, the burden is shared—the buyers are buying less than before and the sellers are also selling less. Yet nobody is interested in any change and the equilibrium is there to stay.

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UNIT - IV

MONOPOLY COMPETITION

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

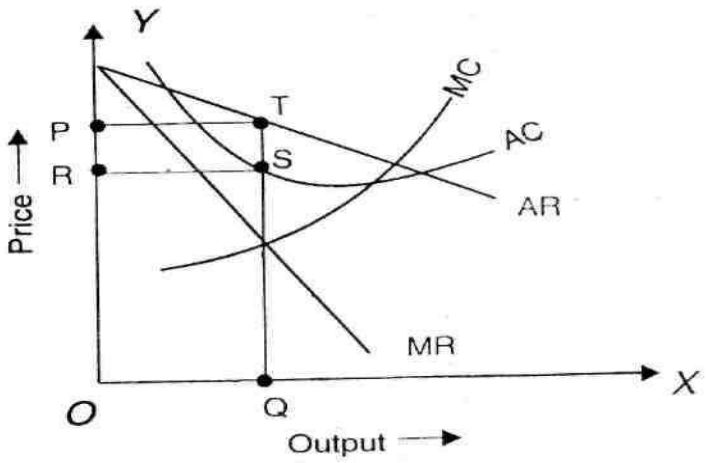
- There is a single producer or seller of the product.
- There are no close substitutes for the product. If there is a substitute, then the monopoly power is lost.
- No freedom to enter as there exists strong barriers to entry.
- The monopolist may use his monopolistic power in any manner to get maximum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

PRICE-OUTPUT DETERMINATION UNDER MONOPOLY

The monopolist, to be in equilibrium should satisfy two conditions :\

(I)Marginal cost should be equal to marginal revenue and

(II) The marginal cost curve should cut marginal revenue curve from below. The short run equilibrium of the monopolist is shown in figure



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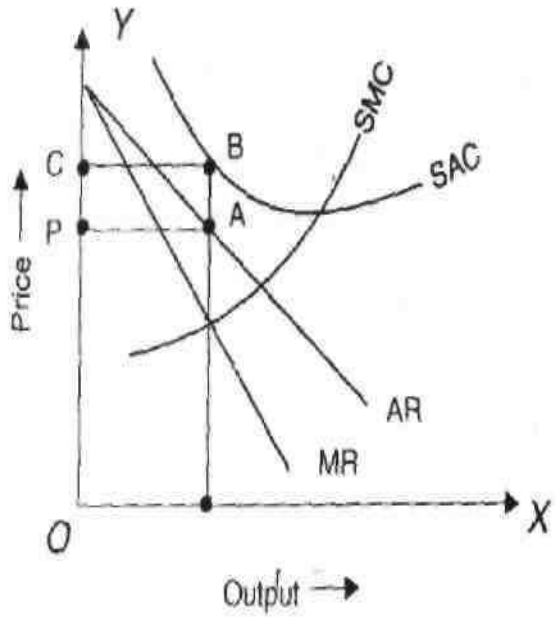
AR is the average revenue curve, MR is the marginal revenue curve, AC is the average cost curve and MC is the marginal cost curve. Upto OQ level of output marginal revenue is greater than marginal cost but beyond OQ the marginal revenue is less than marginal cost. Therefore, the monopolist will be in 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.



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

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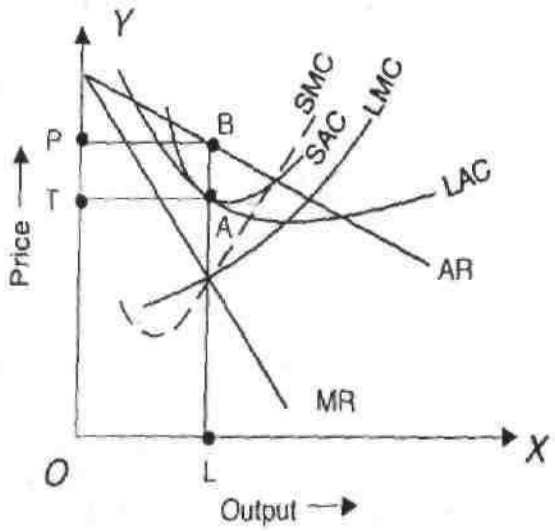
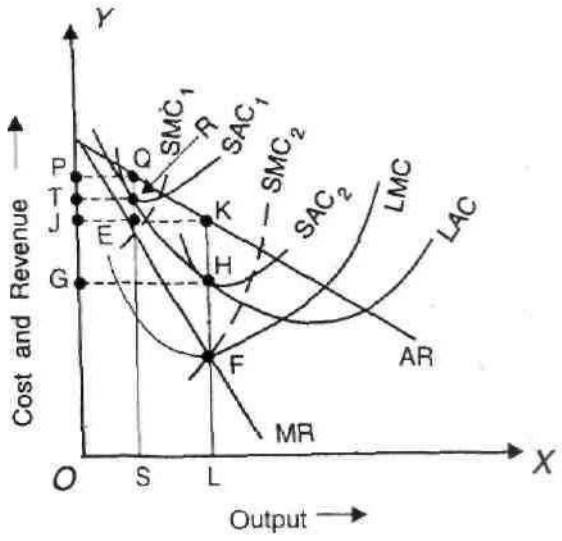


The monopolist is in equilibrium at OL output where LMC cuts MR curve. He will charge OP price and earn an abnormal profit equal to TPQH

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.



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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. Pricdiscrimination is personal when a seller charges different prices for different persons.

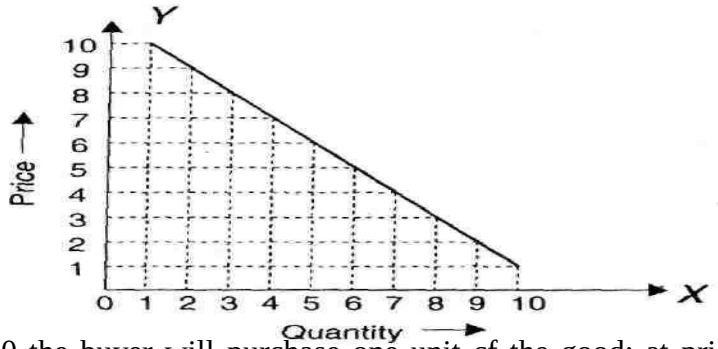
Degrees of price discrimination

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.



At price Rs. 10 the buyer will purchase one unit cf 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.

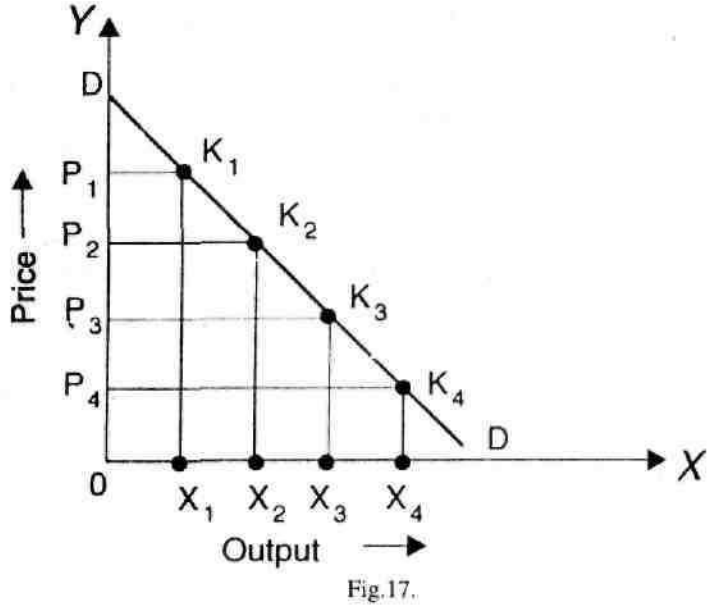


Fig.17.

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:

- 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 differentfees 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.
- 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.
- 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.

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- 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.
- When a monopolist is able to meet different needs for his customers it is possible for him to follow price discrimination.

- 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.

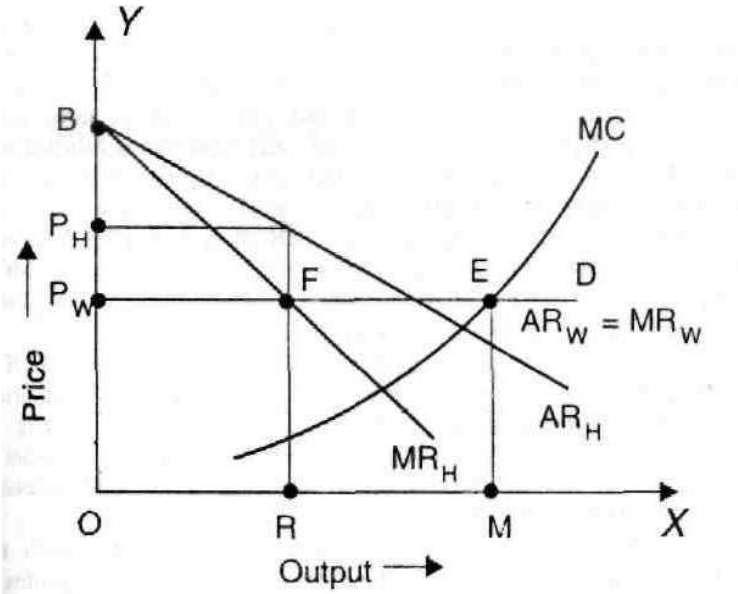
Equilibrium under price discrimination in the case of dumping

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.

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.



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.

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 figure

Absence of Supply Curve under Monopoly!

An important feature of the monopoly is that, unlike a competitive firm, the monopolist does not have the supply curve. It is worth noting that the supply curve shows how much output a firm will produce at various given prices of a product.

The supply curve of a product by a firm traces out the unique price-output relationship, that is, against a given price there is a particular amount of output which the firm will produce and sell in the market.The concept of supply curve is relevant only when the firm exercises no control over the price of the product and therefore takes it as given.

Therefore, it is perfectly competitive firm which is a price taker and demand curve facing it is a horizontal straight line that a unique price-output relationship is established. For a perfectly competitive firm, marginal revenue (MR) equals price and therefore to maximize profits, the firm equates price (= MR) with marginal cost.

As price changes due to the shift in demand, the competitive firm equates the new higher price (i.e. new MR) with its marginal cost at higher level of output. In this way under perfect competition, marginal cost curve becomes the supply curve of the firm.

To quote professor Baumol, "The supply curve is strictly speaking, a concept which is usually relevant only for the case of pure or perfect competition …. The reason for this lies in its definition … the supply curve is designed to answer question of the form, "How much will firm A supply if it encounters a price which is at P dollars. But such a question is most relevant to the behaviour of firms that actually deal with price over whose determination they exercise no influence."

But a monopolist does not take the price as given and exercises control over the price of the product as he is the sole producer of the product. Further, for a monopoly firm demand curve slopes downward and marginal revenue (MR) curve lies below it.

Therefore, a monopolist in order to maximise profits does not equate price with marginal cost; instead he equates marginal revenue with marginal cost. As a result, shifts in demand causing changes in price do not trace out a unique price-output series as happens in case of a perfectly competitive firm.

In fact, under monopoly shifts in demand can lead to a change in price with no change in output or a change in output with no change in price or they can lead to changes in both price and output. This renders the concept of supply curve inapplicable and irrelevant under conditions of monopoly.

Thus, there is no unique price-quantity relationship, since quantity supplied by a firm under monopoly is not determined by price but instead by marginal revenue, given the marginal cost curve. Thus, Joan Robinson writes, "When competition is not perfect, the demand curve for the output of each individual producer is not perfectly elastic and each producer will sell that output at which his marginal cost is equal to his marginal receipts Marginal revenue will not be equal to price, it is marginal revenue and not price that determines output of the individual producer."

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That, under monopoly, we do not get a series of unique price-output relationship or supply curve of a product is illustrated in Figure 26.13. Suppose the demand curve is initially D_1, corresponding to which MR_1 is the marginal revenue curve. Given the marginal cost curve MC, monopolist is in equilibrium at OM level of output and charging price OP_1.

Now, suppose that demand curve shifts to the position D_2 corresponding to which MR_2 is the marginal revenue curve. It will be seen from Fig. 26.13 that the new marginal revenue curve MR_2 also intersects the given marginal cost curve MC at the same level of output OM as before the shift in the demand curve but price has risen to OP_2.

Thus we see that under monopoly, a shift in demand may lead to the production and supply of the same output at two different prices. This clearly shows that there is no unique price-output relationship which is essential for the concept of supply curve to be applicable.

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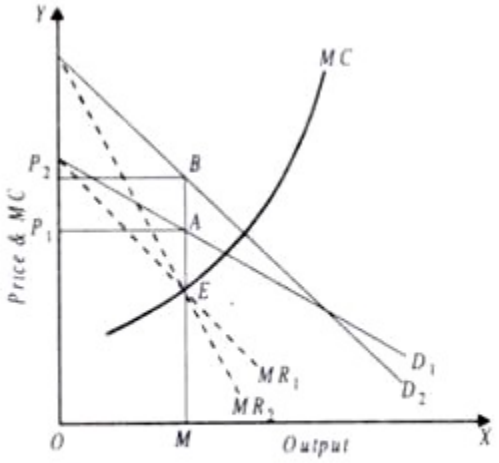

Fig. 26.13. *Under monopoly a shift in demand leading to the same output being supplied at two different prices.*

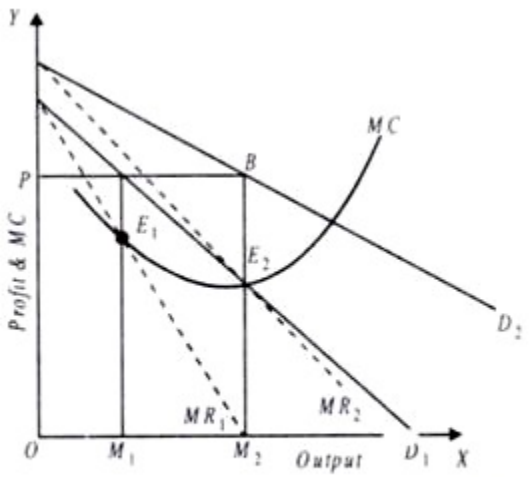

Fig. 26.14. *Under monopoly a shift in demand may lead to a change in output being supplied at the same price.*

Figure 26.14 illustrates another special case where shift in demand leads to the different levels of output being supplied at the same price. Initially, with D, and MR_X as the demand and marginal revenue curves respectively, the monopolist maximises his profits by producing output OM_1 and charging price OP.

With the shift in demand curve to D_2 and the marginal revenue curve to MR_2, the marginal cost curve MC cuts the new MR_2 curve at E_2 and it will be observed from Figure 26.14 that in the new equilibrium, the monopolist produces higher quantity OM_2 at the same price OP. This again shows that under monopoly there is no any specific quantity of the product supplied at a price.

To sum up, under monopoly, there is no supply curve associating a unique output with a price. Shift in demand may lead to either change in price with the same output being produced and supplied or it may lead to the change in output with same price.

However, usually the shift in demand would lead to the changes in both output and price. How price and output will change as a result of shift in demand depends not only on the marginal cost curve but also on the price elasticity of demand.

The important thing to remember is that in sharp contrast to the case of a perfectly competitive firm, under monopoly marginal cost curve does not serve as the supply curve of the firm and further that there is no supply curve under monopoly depicting unique price-output relationship.

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Measuring Monopoly Power:

The distinction between a perfectly competitive firm and a monopoly is that, for the competitive firm, P = MC, for the firm with monopoly power, P > MC.

Thus, a natural way to measure monopoly power is to examine the extent to which the profit-maximising P > MC. We can, in fact, use the mark up ratio of (P-MC)/P that was introduced as a rule of thumb pricing.

This measure is introduced by Lerner and is called Lemer's Degree of Monopoly Power: . L= (P-MC)/P.This Lerner Index has always a value of zero and one. For a perfectly competitive firm, L = 0, so that P = MC. The larger is L, the greater the degree of monopoly power.

This index of monopoly power can also be expressed in terms of the elasticity of demand facing the firm. Using equation (1), we know that

$L = (P-MC)/P = 1/E_d$ ……..(3)

Where E_d is the elasticity of the firm's demand curve, and not the market demand curve. If the elasticity of demand for the firm is -6, the degree of monopoly power is 1/6. It may be noted that considerable monopoly power does not necessarily imply high profits. Profit depends on AC relative to price.

A Rule of Thumb for Pricing:

We know that price and output should be chosen so that MR = MC, but how does the manager of a firm find the correct price and output level, in practice? Managers may have only limited knowledge of the AR and MR that their firms face.

Similarly, they might have little knowledge about the firm's MC curve. Thus, we want to translate the condition that MR should equal MC into a rule of thumb that can be more easily applied in practice.

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To do this, we write the expression MR = dR/dQ = d (PQ)/Q

It may be noted that the extra revenue from an incremental unit of quantity, d(PQ)/dQ, has two components. Producing one extra unit of output and selling at price P brings in revenue of (1)(P) = P. Since the firm faces a downward-sloping demand curve, producing and selling an extra unit also results in a small drop in price dP/dQ, which reduces the revenue from all units sold. Thus, MR = Q dP/dQ =P+P (p/Q)(dP/dQ)

We find the expression on the right by taking the term Q(dP/dQ) and multiplying and dividing it by P. The elasticity of demand is defined as E_d = (P/Q) (dP/dQ). Hence, (Q/P)(dP/ dQ) is reciprocal of the elasticity of demand, $1/E_d$, measured at the profit-maximising output, and MR = P + P($1/E_d$).

Now, since the objective of the firm is to maximise profit, we can equate MR = MC: P + P ($1/E_d$) – MC, which can be rearranged to give us

P-MC/P = 1 /E_d…….(1)

This provides a rule of thumb for pricing. The term P-MC/P is the markup over MC as a percentage of price which states that this mark-up should equal minus the inverse of the elasticity of demand.

Equivalently, we can rearrange this as:

P = MC/1+($1/E_d$)

For example, if the elasticity of demand is -4 and MC – £9 per unit,

P = £ 9 /(1-1/4) = £ 9×4/3 = £12 per unit.

How does the price fixed by a monopolist compare with the price under competition? In a perfectly competitive market, as we know, P = MC. A monopolist charges a price that exceeds MC, by an amount that depends inversely on the elasticity of demand.

As the mark up equation (1) shows, if the demand is extremely elastic, E_d is a large negative number, and P will be very close to MC, so the monopolised market looks much like a

competitive one. In fact, when demand is very elastic, there is very little benefit to being a monopolist.

Social Cost of Monopoly: Monopoly and Inefficiency!

An important difference between monopoly and perfect competition is that whereas under perfect competition allocation of resources is optimum and therefore social welfare is maximum, under monopoly resources are misallocated causing loss of social welfare.

When a product is produced and sold under conditions of monopoly, the monopolist gains at the expense of consumers, for they have to pay a price higher than marginal cost of production. This results in loss of consumers' welfare. Which is greater? Monopolist's gain or consumers' loss. To measure welfare gain or loss some economists have used the concept of consumer's surplus.

Consumer's surplus, is the surplus of price which consumers are prepared to pay for a commodity over and above what they actually pay for it. The dead-weight loss in consumer's welfare due to monopoly can be shown through Figure 26.12 where TD is the demand curve for the monopolist product MR is the corresponding marginal revenue curve. It is assumed that the industry is a constant cost industry so that average cost (AC) remains the same as output is increased and marginal cost is equal to it.

Under perfect competition firms equate price with marginal cost and industry's output is determined by demand for and supply of the product. Since we are considering a constant cost industry, a horizontal line (AC=MC) is the supply curve of the industry. It will be seen from Figure 26.12 that under perfect competition price determined is equal to QK (or OP_c) and output OQ is being produced.

Firms will be equating price $0P_c$with their marginal cost. The consumer surplus enjoyed by the consumers is equal to the area TKP_C. It may be noted that consumer surplus reflects social welfare as it is excess of what consumers are willing to pay (that is, the utility that they obtain) over and above what they actually pay.

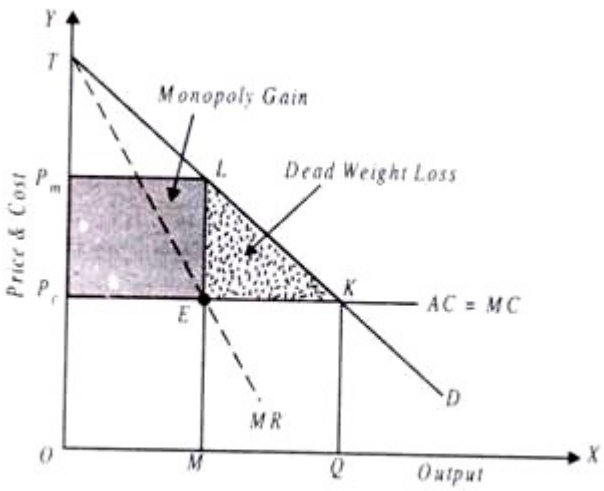

Fig. 26.12. *Dead-weight Loss or Social Cost of Monopoly*

Now, the monopolist would not produce OP_c output as he equates marginal revenue (MR) with marginal cost (MC) to maximise his profits. It will be seen from Fig. 26.12 that marginal revenue and marginal cost are equal at output level OM. Therefore the monopolist will produce OM output and charge ML or OP_m price. Thus, monopolist has restricted output to OM and raised price to OP_m.

As a result monopolist makes profits equal to the area P_mLEP_c. On the other hand, as a result of rise in price to P_m, the consumers' surplus has been reduced to the area $TLP_m$and they suffer a loss of consumer surplus equal to the area P_cKLP_m. Thus there is a redistribution of income from consumers to the monopolist, but it is important to note that loss of consumer surplus P_cKLP_m which is greater than the profits made by the monopolist by the area of triangle LKE.

The loss in consumer surplus can be divided into two components. First part is the profits equal to the area P_mLEP_c made by the monopolist at the expense of the consumers. This component of loss in consumer surplus is suffered by those who are still purchasing the product.

The second component of the loss of consumer surplus is equal to the area of triangle LKE which is due to allocative inefficiency caused by the monopolist by reducing output of the

product and raising its price. This second component of loss in consumer surplus as measured by the area of triangle LKE is called dead-weight loss of welfare caused by the monopolist.

This represents social cost of monopoly. It will be seen from Figure 26.12 that price which the last existing consumer is willing to pay for Mth unit is M_L while the marginal cost which has to be incurred by the society is ME and therefore from Mth unit, consumer enjoys consumer surplus equal to EL.

In other words, consumer values the product more than the opportunity cost of production as measured by the marginal cost (MC). Likewise, the price which the consumers are willing to pay for additional MQ units exceeds the marginal cost (MC) to the society and therefore generates additional consumer surplus.

Thus, the social welfare or consumer surplus would be increased if output is extended to the point Q. It will be seen from Figure 26.12 that consumers would gain additional consumer surplus equal to the area of triangle LKE if output is increased to OQ.

But monopolist would not extend output to point Q because his profits are maximised at OM output. Since for extra units from M to Q, marginal cost exceeds marginal revenue of the monopolist, he will not produce them. But from the social point of view, the extension of output to the point Q is desirable as it increases consumer surplus gained by the consumers.

Thus, monopoly causes a net loss of consumer welfare equal to area of triangle LKE. This is called a dead weight loss of welfare because though consumers suffer a loss of welfare, no one else, not even monopolist, gains from it. This is loss of welfare caused by allocative inefficiency of the monopoly.

Dead – Weight Loss (Social Cost) under Monopoly in Case of Increasing Marginal Cost:

In our above analysis of dead-weight welfare loss (or, in other words, social cost of monopoly) due to reduction in output and hike in the price by a monopolist as compared to the perfectly competitive equilibrium, it has been assumed that marginal cost curve is a horizontal straight line.

When marginal cost curve is a horizontal straight line, the loss in welfare occurs only in consumer surplus. But when marginal cost curve is rising, the loss in welfare due to reduction in output by the monopolist will occur not only in reduction in consumer surplus but also in producer surplus.

Producer surplus, it will be recalled, is the total revenue earned over and over all the opportunity costs (explicit and implicit) represented by the marginal cost curve. It may be noted that maximum social welfare or economic efficiency is achieved when the sum of consumer surplus and producer surplus is the maximum.

In a perfectly competitive equilibrium where quantity demanded equals quantity supplied or price equals marginal cost, the sum of consumer surplus and producer surplus is maximum and therefore perfect competition ensures maximum social welfare or economic efficiency. But to maximize profits monopolist does no’ equate price with marginal cost.

Instead, he equates marginal revenue with marginal cost and therefore reduces output and raises price and thereby causes loss of welfare. Loss in welfare as measured by the reduction in the sum of consumer surplus and producer surplus is illustrated in Figure 26.12(a).

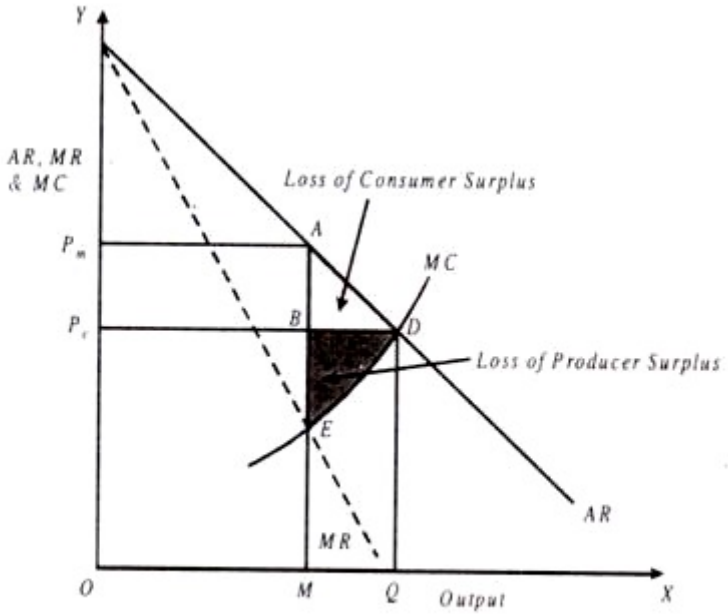

Fig. 26.12(a). *Dead-Weight Loss in Welfare in Case of Increasing Marginal Cost.*

It will be seen that, under perfect competition, equilibrium will be at point D where price is equal to marginal cost (MC) and OQ output is being produced and P_c price list being charged. Now, if monopoly comes into existence, the monopolist-producer will maximize profits by producing lower output OM and will charge higher price P_m.

It will be observed that the loss in consumer surplus suffered by the buyers is equal to area P DAP_m. Due to the higher price charged by the monopolist, his gain in profits or producer surplus equals the rectangle P_cBAP_m. (It may be noted that this gain in producer surplus by the monopolist occurs at the expense of consumers who suffer a loss in consumer surplus and is equal to the price differential $P_m – P_c$ or AB multiplied by the monopoly output OM).

Thus the gain in producer surplus represented by the area P BAP is just a transfer of income from the consumers to the monopolist. Net loss of consumer surplus or welfare is therefore the area of the triangle ABD.

However, in the situation depicted in Figure 26.12(a) where marginal cost is rising, apart from the net loss of consumer surplus, there is also a loss of producer surplus due to reduction in output by OM amount under monopoly. It will be seen from Figure 26.12(a) that under perfect

competition with price equal to OP or QD, the extra profits or producer surplus earned over and above the marginal costs in the region of MQ output equals the area BDE which is lost due to the reduction in output equal to QM by the monopolist.

This loss in producer surplus BDE is also a dead weight loss caused by the inefficiency or lower production due to monopoly because this has not benefited any other. Thus, the total dead weight loss of welfare caused by the monopoly is equal to the whole area AED which is the sum of net loss of consumer surplus (ABD) and the loss of producer surplus equal to BDE represents social cost of monopoly.

It follows from the partial equilibrium approach to the measurement of loss of welfare that monopoly is economically inefficient and causes misallocation of resources as it does not extend production of a product to the level at which the sum of consumer surplus and producer surplus is the maximum.

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UNIT –V

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.

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 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 loose only few customers, due to an increase in price.

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.

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.

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 oligopolist.

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.

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, 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.

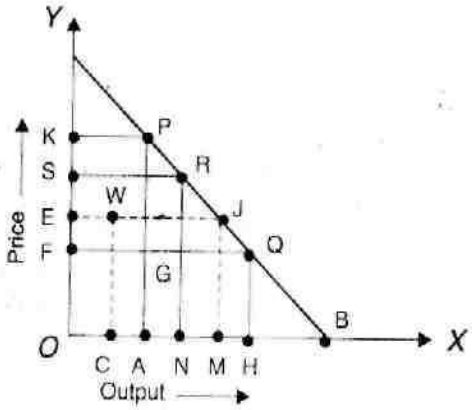
e. Syndicated and organised oligopoly.

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

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 The product is homogenous.

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



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 $\frac{n}{(n+1)}$ 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 the rivals assume the output of the other to be fixed, even though they observe constant changes in output.

Stackeberg Model: A third type of duopoly analysis is suggested by the German economist Stackleberg. This is popularly known as leader-follower analysis. In this version, each firm has the option of either becoming a leader or remaining as a follower. A follower in this set up will behave like the firm in Cournot model, treating the leaders output as given. A leader knows that the follower is going to treat his (leader's) output as given and then proceeds to maximize profits given this assumption. Each firm would calculate its profits in both the alternatives-as a leader and as a follower-and then choose that role which gives greatest profit. You will realize that when both the firms do this they will naturally figure out that it does not pay to be a follower. If each firm decides to take on the role of leader, no equilibrium can be reached. This is the symptom of "Stackleberg Disequilibrium".

Most models of duopoly contain an element of speculation of what the other firm will do. Indeed, all these can be extended to cover 0lig9polistic markets but the essential features will not change. The failure of the market to reach equilibrium, price-volume combination appears as the most striking, feature in these models. It is quite natural to imagine that the firms would try to cooperate in some way in order to reduce the uncertainty of rivals'

actions. The cooperation may not be formal or clearly expressed as such.

Oligopoly -The Kinked Demand Curve Hypothesis: We now come to probably the most intriguing part of the market structure analysis. When there are a few firms who sell either differentiated products or a homogeneous product we say that the market is Oligopolistic. Of these, differentiated products can offer interesting behavior patterns amongst firms. The particular theory that we shall deal with in this section was simultaneously but independently developed by Paul Sweezy in the U.S.A. and Hall & Hitch in the U.K. around 1939. These researchers observed that Oligopolistic situations lead to rigid prices. The price changes are infrequent. Besides, they are guided more by competitors' behavior than by the objective demand and cost conditions. This is quite _ difference between monopoly pricing where a change in demand and cost curves can be instantaneously matched by a price adjustment.

In oligopoly with differentiated products each firm has to make some intelligent guess about the competitors' response to a given action by the firm. The Kinked demand curve hypothesis states that rivals behave one way when a firm cuts its price, viz. match the cuts, but behave another way when a firm raises its current price viz. hole price constant at the current level. The behavioral assumption behind this theorization is quite easy to appreciate. When one firm cuts its price, rivals do not want that firm to unduly gain in market shares and therefore they will follow suit. 0 the other hand, when the price is increased, rivals think that it has given them an opportunity to grab more sales since they now are more competitive on the price front. Hence, a price increase is not followed by the rivals. The prices therefore tend to change infrequently, flexible downwards but inflexible upwards.

Dominant Firm Model: If there is one dominant firm in an Oligopolistic market and the rest of the firm act as followers we will have a mixture of monopoly and perfect competition. The followers take market price as given and set their MC's to that price in order to maximize profits. The dominant firm acts as price leader and maximizes profit by taking the supply curve of the followers as given The dominant firm acts as a monopolist constrained only by the supply of the, rest of the lot (called the fringe firms). It can be shown that the presence of some firms which offer products at competitive prices dampens the degree of the dominant firm's control over the market price. If the market share of the followers goes up, the monopoly power of the leader suffers accordingly. Thus, in this formulation the equilibrium price is lower than what would be obtained by a pure monopolist. What are the methods by which a dominant firm can maintain its dominance in the market? Some well known responses are:

1) Try and keep the industry price low enough to deter entry and also make expansion of fringe firms unattractive.
2) Innovate on 'non-price competitive areas'-promotion, distribution, after sales service etc.
3) A defensive strategy involving confrontation with the aggressive fringe firms. In order to

illustrate a real life competitive situation we reproduce below a case.

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B.COM PA–FIFTH SEMESTER

MICRO ECONOMICS

Question	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E	Answer
The law of demand states that an increase in the price of a good	Increases the supply of that good.	Decreases the quantity demande	ncreases the quantity supplied of that good.	None of these answers.		Decreases the quantity demanded for that good.
The law of demand states that an increase in the price of a good	An increase in the price of watches	None of these answers	A decrease in the price of watc	A decrease in consumer incomes if watches are a normal good		A decrease in the price of watch batteries if watch batteries and watches are complements
The price elasticity of demand is defined as	The percentage change in the quantity demanded divided by the percentage change in income.	The percentage change in incom	The percentage change in the q	d. The percentage change in price of a good divided by the percentage		The percentage change in the quantity demanded of a good divided by the percentage change in the price of that good.
If the cross-price elasticity between two goods is negative, t	Substitutes. .	complements	Necessities	Luxuriesc.		complements
commodity, when:	MUx= Px	MUx>Px	MUx<Px	MUx = 0		MUx= Px
The slope indifference curve is equal to:	One	marginal rate of substitution	Marginal utility	none of these		marginal rate of substitution
Why is indifference curve convex to origin?	utility	Due to monotonic preferences	Due to continuous decline of m	Both a and b		Due to continuous decline of marginal rate of substitution
curve:	Higher the indifference curves higher	Two indifference curves cannot	indifference curve is convex to	Indifference curve is concave to origin		Indifference curve is concave to origin
A set of ICs drawn in a graph is called:	Indifference curve	indifference map	budget line	all of these		indifference map
Two indifference curves cannot cut each other because:	They slope downwards.	They are convex to origin	They represent those combinati	Each indifference curve represents a different level of satisfaction		Each indifference curve represents a different level of satisfaction
Downward slope of the demand curve shows:	Positive relationship between price a	Inverse relationship between pri	No relationship between price	None of these		Inverse relationship between price and quantity demanded
Movement along the demand curve occurs due to change in	Own price of the commodity	Determinants of demand, other t	Both (a) and (b)	None of these		Own price of the commodity
change in its own price, other things remaining constant,	cross price effect	price effect	income effect	substitution effect		price effect
In case of contraction of demand, we move:	the same demand curve	to right on the another demand c	point on the same demand	to left on the another demand curve		from lower point to upper point on the same demand curve
Assumptions of the law of demand refer to:	constant own price of the commodity	determinants of demand, other t	constant cost of production	none of these		determinants of demand, other than own price of the commodity
OIKONOMIKUS which means	Business Management	Economics	Wealth Management	House Management		House Management
Who is assured as father of Economics?	Adam Smith	Robinson	Marshall	Marshall		Adam Smith
Utility is measured by	wealth	price	value or worth	income		value or worth
If marginal utility is zero	Total utility is zero	consumption will decrease total	consumption will increase total	Total utility is maximised		Total utility is maximised
In relatively elastic demand ED is ------	E=1	E=0	E>1	E<1		E>1
Which of the following is Gossen's first law:	Law of Diminishing Marginal Utility	Law of Equi Marginal Utility	Law of substitution	Law of Diminishing Returns		Law of Diminishing Marginal Utility
Economics is a ----- science which deals with human want	Social	Political	Natural	Physical		Social
---------- focuses on the behavior of the individual act	Macroeconomics	Microeconomics	Managerial Economics	Economics		Microeconomics
The term `Economics" in English language has its origin in	Greek	Italic	Latin	Indian		Greek
Economics deals primarily with the concept of	Poverty	Scarcity	Change	Power		Scarcity
Microeconomics focuses on all of the following EXCEPT	The effect of increasing the money su	The purchasing decisions that an	The effect of an increase in the	The hiring decisions that a business makes		The effect of increasing the money supply on inflation
Which of the following factor is important for demand alon	Selling Power	Ability to Buy	Product Development	New product Launch		Ability to Buy
People wants are	More	Limited	Unlimited	Few		Unlimited
When one speaks of "demand" in a particular market, this r	the quantity demanded at a given pric	only one price-quantity combina	only one point on the entire der	the whole demand curve		the whole demand curve
For inferior commodities, income effect is	Zero	Negative	Infinite	Positive		Zero
relative change in money income is ----------	High	Zero	Low	Negative		Low
People demand more of product X when the price of prod	complements.	substitutes	not related.	both inexpensive		substitutes
Derived demand is directly determined by _____	utility	the profitability of using inputs t	the ability to satisfy consumer c	personal consumption		the profitability of using inputs to produce output
A positive cross elasticity of demand coefficient indicates t	A product is an inferior good	A product is a normal good	Two products are substitute go	Two products are complementary goods		Two products are substitute goods
Car and petrol are ---------- goods	Substitutes	Complementary	producers	None of the above		Complementary
Tea and coffee are ---------- Goods	Substitutes	Complementay	Producers	None of the above		Substitutes
A fall in the price of a commodity leads to _____	shift in demand.	a fall in demand.	a rise in the consumers real inc	a fall in the consumers real income		a rise in the consumers real income
An increase in demand can result from _____	a decline in market price	an increase in income.	a reduction in the price of a sut	an increase in the price of complements		an increase in income.
In a normal demand schedule, quantity demanded _____	is independent of price	changes inversely with price	changes directly with price.	remains unchanged despite price change		changes inversely with price
Decrease in demand means _____	movement upward on a demand curv	movement downward on the der	shift downward of a demand c	shift upward of a demand curve		shift downward of a demand curve
.Elasticity of demand is _____	slope of the demand curve	usually unity	usually zero	demanded to a change in price.		demanded to a change in price.

If demand is elastic and price increases _____.	total revenue will remain unchanged.	total revenue will fall	total revenue will rise	total revenue will become zero	total revenue will fall
How would you indicate relatively inelastic demand by usin	E = Zero	E is less than 1.	E is greater than 1	E = 1.	E is less than 1.
If the income elasticity of demand is greater than unity, the	a necessity	a luxury	an inferior good.	a non-related good	a luxury
A demand curve which is a horizontal straight line has an e	zero.	greater than zero but less than or	one	infinite	infinite
The income effect _____	must always be negative	must always be positive	can be negative	must be smaller than substitution effect	can be negative
Economics is the science of wealth who gave this definition	J.K.Mehta	Marshall	Adam Smith	Robbins	Adam Smith
Peoples wants are --------	More	Limited	Unlimited	Few	Unlimited
The subject matter of economics is -------	ensure economic progress of the peo	run business	To satisfy unlimited wants with	To mobilize resources and to use them.	limited means
Micro economic theory is also known as ---------	Business Theory	Price Theory	Individual Theory	Cost theory	Price Theory
Which of the following is included in exceptions to the law	Giffen Goods	Prestigious goods	Demonstration effect	All of the above	All of the above
When a commodity with many uses is demanded then it is c	Direct demand	Joint demand	Composite demand	None of these	Composite demand
Demand for a commodity refers to-------	Desire of the commodity	need for the commodity	quantity demand of that commodit	quantity of the commodity	quantity of the commodity
All of the following them determinants of demand except --	Taste and Preference	Quantity supplied	Income	Price of related goods	Quantity supplied
If due to fall in the price of good X , demand for good Y ri	Substitutes	Complements	Not related	Competitive	Complements
Utility is measured in terms of ----------.	Rupee	Utils	Ranks	All the above	Utils
What would be a price elasticity of demand at the midpoint of straight line demand curve?	Ed=0	Ed=1	Ed is greater than one	Ed is less than one	Ed=1
Normally demand curve will have shape ----------	Horizontal	Vertical	Downward	Upward	Downward
Knowing about substitution and income effect one can predict tha	An increase in the wage rate will increase	An increase in the wage rate will	Winning lottery will increase labor	Winning the lottery will have an ambiguous effect on labour supply	Winning lottery will increase labour supply
The indifference curve means ----------	Equal consumption of two goods	Equal utility from the consumption of two combination of goods	Equal consumer income	Equal prices of the goods consumed	Equal utility from the consumption of two combination of goods

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UNIT - II						
S.NO	Question	**OPTION A**	**OPTION C**	**OPTION D**	**OPTION E**	**Answer**
1	Given the price, if the cost of production increases because of higher price of raw materials, the supply	Decreases	Remains same	Any of the above		**Decreases**
2	The cost recorded in the books of accounts are considered as	Total cost	Average cost	Explicit cost		**Explicit cost**
3	The out of pocket costs are .	Sunk costs	Explicit costs	Social costs		**Marginal costs**
4	The short run Average Cost curve is shaped	V shape	L shape	Any of the above		U shape
5	Tea and coffee are ----- goods	substitutes	producers	none of the above		**substitutes**
6	----- Economics views on reducing the production costs	internal	pecuniary	External		**External**
7	Which of the following are not related with factors of production(FOP)	land	raw material	labour		**raw material**
8	Which factor of production is considered as fixed input	labour	capital	land		**land**
9	Marginal cost is defined as	change in total cost due to change in output	change in output due to a change in an input	total product divided by the quantity of input		**change in total cost due to change in output**
10	The cost with which the concept of marginal cost is closely related	variable cost	opportunity cost	economic cost		**variable cost**
11	Opportunity cost is also known as -------	outlay cost	alternative cost	total cost		**alternative cost**
12	costs are business costs which do not involve any cash payments but for them a provision is made in accounts	private cost	accounting cost	book cost		**book cost**
13	The vertical difference between TVC and TC is equal to	MC	TFC	none		**TFC**
14	The costs that depend on output in the short run are	total variable costs only	total costs only	total fixed cost only		**total variable costs only**
15	A graph showing all the combination of capital and labour available for a given total cost is the	isoquant	isocost line	expenditure set		**isoquant**
16	The formula for average fixed costs is	TFC/Q	Q/TFC	TFC - Q		**TFC/Q**
17	Implicit costs are	equal to total fixed costs	payments for self employed resources	always greater in the short run than in the long run		**payments for self employed resources**
18	Variable costs are	Sunk costs	Cost that change with the level of production	the change in total cost resulting from the production of an additional unit of output		**Sunk costs**
19	Marginal cost curve cuts the average cost curve	at the left of its lowest point	at the right of its lowest point	at its highest point		**at its lowest point**
20	Marginal cost means	Subsitutional cost	multiplication to the total cost	variable cost		**addition to the total cost**
21	A firm encountering economies of scale over some range of output will have a:	rising long-run average cost curve	constant long-run average cost curve	rising, then falling, then rising long-run average cost curve.		**falling long-run average cost curve**
22	Economies and diseconomies of scale explain why the:	short-run average fixed cost curve declines so long as output increases	long-run average total cost curve is typically	short-run average variable cost curve is U-shaped		**long-run average total cost curve is typically U-shaped.**
23	When a firm doubles its inputs and finds that its output has more than doubled, this is known as:	Economies of scale	Diseconomies of scale.	A violation of the law of diminishing returns		**Economies of scale**
24	Passive factor of production is	Only land	Both land and capital	Neither land nor capital		**Both land and capital**
25	Reasons for increasing returns in Stage I of law of variable proportion is	Indivisibility	Both (a) and (b)	None of the above		**Both (a) and (b)**
26	input factor is divided as skilled, semi skilled, unskilled	Land	Technology	labour		**labour**
27	In the Law of Variable Proportion when TP is Maximum then the MP	MP = 1	MP = 0	MP > 1		**MP = 0**
28	When the output increases in the same proportion as the increase in input it is ------ returns	Constant	Decreasing	Increasing		**Constant**
29	Cobb Douglas production function mainly studies	Capital & labour	Land & Labour	Land & capital		**Capital & labour**
30	Which of the following is correct	TC= TFC+ TVC	TVC= TC- TFC	All of the above		**All of the above**
31	In the short run, as economists use the phrase, is characterised by	inputs being variable	at least one fixed factor of production and firm	no variable inputs - that is, all of the factors of production are fixed.		**at least one fixed factor of production and firms neither leaving nor entering the industry.**
32	The rate at which a firm can substitute capital for labour and hold output constant is the	marginal rate of production	marginal rate of factor substitution	isoquant.		**marginal rate of factor substitution**
33	Which would be an implicit cost for a firm? The cost	of worker wages and salaries for the firm.	paid for production supplies for the firm.	of wages foregone by the owner of the firm.		**of wages foregone by the owner of the firm.**
34	The formula for average variable cost (AVC) is	DQ/DTVC.	TVC/Q	Q/TVC.		**TVC/Q**
35	If a firm's revenues just cover all its opportunity costs, then	normal profit is zero	total revenues equal its explicit costs	total revenues equal its implicit costs		**normal profit is zero**
36	Opportunity cost of a factor of production with specific use is	very high	zero	constant		**zero**
37	The accountant never considers	explicit costs	opportunity costs	total cost		**opportunity costs**
38	Incremental cost is closely related to	average cost	cost	fixed cost		**marginal cost**
39	When inputs are increased in a given proportion and output increases in a greater proportion, the returns to sca	Constant returns to scale	Decreasing retuns to scale	None		**Increasing returns to scale**
40	Which of the following curve is not U-shaped?	AVC	AC	MC		**AFC**
41	Off all the factors of production given below, which one is perishable in nature	labour	capital	entrepreneurship		**labour**
42	Opportunity cost is a term which describes	bargain price for a factor of production.	variable costs	cost of one product in terms of production of others forgone		**cost of one product in terms of production of others forgone**
43	Total cost is	overall cost associated with a given level of output	determined by adding marginal cost and aver	fixed cost plus marginal cost		**overall cost associated with a given level of output**
44	An LAC curve is known as .	envelope curve.	curve	plant curve		**envelope curve.**
45	The marginal product equals the average product when the latter is .	Half of its maximum value	equals to its maximum value	equals to its minimum value		**equals to its minimum value**
46	The firm cost functions are determined by .	the price of its product	its production function	the age of the firm		**its production function**
47	Production is involves the uses of _____	outputs	variable	goods		**inputs**
48	The amount of production factors to produce a unit is called	cumulative coefficient	input coefficient	output coefficient		**technical coefficient**
49	The production function conerned with explaining	minimum quantity	marginal quantity	marginal value		**maximum quantity**
50	Production is the backbone of activity	social	economic	managerial		**economic**
51	A Process of values to natural resource is called production	deleting	multiplying	substracting		**adding**
52	Main objective of every producer is	Maximum Income	Maximum Interest	Less losses		**Maximum profits**
53	Law of constant returns line	vertical	horizontal	straight line		**horizontal**
54	Production is a in which relates to both goods &service	short term	wider term	very short term		**wider term**
55	Production goods have _____ values	normal	less	transform		**exchange**
56	The concept of production function describe _____ possibilities	logical	conceptual	technological		**technological**
57	Production function is one which one factor is _____ while others are constant	labourer	scale	returns		**variable**
58	Diminishing marginal returns are reference to	Industry	Agricultural	production		**Agricultural**
59	Total number of units of output produced per unit is called	marginal product	decreasing product	average product		**total product**
60	is the original price of plant and materials paid by firm	Replacement cost	shortrun cost	horizontal cost		**horizontal cost**

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UNIT - III								
S.NO	Question	**OPTION A**	**OPTION B**	**OPTION C**	**OPTION D**			**Answer**
1	Perfect competition is a market situation where we have a	a single seller	two sellers	large number of sellers	few sellers			**large number of sellers**
2	A firm can achieve equilibrium when its	MC = MR	MC = AC	MR = AR	MR = AC			**MC = MR**
3	In a perfectly competitive market, the firm will be ----------	a price maker	attempting to maximise profits	Producing a product which will be different from its competitors	a price taker			**a price taker**
4	Under perfect competition, the demand curve is	Upward sloping	horizontal	downward sloping	vertical			**horizontal**
5	Most important form of selling cost is	Advertisement	Sales	Homogeneous product	monopoly cost			**Advertisement**
6	Under perfect competition, the firms are producing _____product	Different	Other	homogeneous	not related			**homogeneous**
7	When the Average revenue of the firm is greater than its average cost, the firm is earning _____	Super normal profit	normal profit	normal loss	normal revenue			**Super normal profit**
8	In perfect competition the selling cost is	zero	insignificant	very high	high			**zero**
9	_____ is a market situation where there are infinite numbers of sellers	Oligopoly	Perfect competition	Duopoly	Monopoly			**Perfect competition**
10	Prices under perfect competition are determined by _____and each firm has to follow	individual company	industry	company	person			**industry**
11	The goods which perish very quickly is called	Non perishable goods	Not perishable	Perishable goods	Artificial goods			**Perishable goods**
12	Pure competition is a large number of small firms selling a _____product	homogeneous	different	any	many			**homogeneous**

13	in perfect competition entry or exit is_____	free	restricted	strictly restricted	without permission			**free**
14	in perfect competition degree of monopoly power is _____	Complete	zero	limited	considerable			**zero**
15	Commodities that are demanded and supplied over a region have	regional market	Local market	national market	international market			**regional market**
16	in perfect competition shape of demand curve is _____	perfectly elastic	inelastic	elastic	undefined			**perfectly elastic**
17	Vegetables are example for	perishable goods	non perishable goods	artificial goods	not perishable			**perishable goods**
18	In perfect competition, the marginal revenue curve	And the demand curves facing the firm are identical	Is always above the demand curve facing the firm	Is always below the demand curve facing the firm	Intersects the demand curve when marginal revenue is minimized.			**And the demand curves facing the firm are identical**
19	While determining equilibrium of firm in short run for perfect competition, the X-axis in the diagram represents ------	Revenue	Output	Cost	Price			**Output**
20	Under perfect competition, rivalry is ----------	impersonal	very personal and direct, advertising being important	Nonexistent since the firms cooperate	control output			**very personal and direct, advertising being important**
21	Under perfect competition, price of the product	Can be controlled	Cannot be controlled	Can be controlled within certain limit	None of the above			**Cannot be controlled**
22	In perfect competition, the price of the product is determined where the industry	Elasticity of supply equals the industry elasticity of demand	Supply curve and industry demand curve intersect	Fixed cost is zero	Average variable cost equals the industry average total cost			**Supply curve and industry demand curve intersect**
23	Market Equilibrium relates to …….	Demand & Supply	Production and Raw Material	Demand and Price	Supply and Production			**Demand & Supply**

24	Under perfect competition firms do not engage in price-war because ----------	firms work in co-operation with one another under the same.	number of firms under the same is very large	the demand for the product of a firm under the same is perfectly elastic	all the above mentioned conditions are responsible			**number of firms under the same is very large**
25	Which of the following industry is most closely approximates the perfectly competitive model	Automobiles	Cigarette	Newspaper	Wheat farming			**Wheat farming**
26	Uniform price is a feature of	Perfect competition	Monopoly	Monopolistic competition	Oligopoly			**Perfect competition**
27	Which of the following is not a feature of a perfectly competitive market	Large number of buyers and sellers	Homogeneous product	Group behaviour	Perfect competition			**Group behaviour**
28	A perfectly competitive firm gets only normal profit when	MC = MR	AC = AR	AC < AR	MC = AR			**AC = AR**
29	Which one of the following is a feature of a perfect competition	Group behavior	Selling cost	Homogeneous product	Differentiated product			**Homogeneous product**
30	Average revenue curve under perfect competition is	Upward sloping	Downward sloping	Horizontal straight line	Vertical straight line			**Horizontal straight line**
31	Marginal revenue curve under perfect competition is	Upward sloping	Downward sloping	Horizontal straight line	Vertical straight line			**Horizontal straight line**
32	Perfect competition prevails when the demand for the output of each producer is	Elastic	Perfectly elastic	Inelastic	Perfectly inelastic			**Perfectly inelastic**
33	Equilibrium price is determined under perfect competition by	The market demand	The market supply	The interaction between market demand and market supply	None of the above			**The interaction between market demand and market supply**
34	In the market period, market supply curve is	Perfectly elastic	Perfectly inelastic	Elastic	Inelastic			**Perfectly inelastic**
35	Given the supply of a commodity, in the market period, the price of a commodity is determined by	The market demand curve alone	The market supply curve alone	The market demand curve and the market supply curve	None of the above			**The market demand curve alone**

36	Total profit is maximum when	Total revenue is equal to total cost	Total revenue is greater than total cost	The positive difference between total revenue and total costs is largest.	All of the above			**The positive difference between total revenue and total costs is largest.**
37	Total profits are maximized where	TR equals TC	TR curve and TC curve are parallel	TR curve and TC curves are parallel and TC exceeds TR	TR curve and TC curves are parallel and TR exceeds TC			**TR curve and TC curves are parallel and TR exceeds TC**
38	The equality between MC and MR is	A necessary condition for equilibrium of the firm under perfect condition	A sufficient condition for equilibrium of the firm under perfect competition	A necessary but not sufficient condition for equilibrium of the firm under perfect condition	A necessary and sufficient condition for equilibrium of the firm under perfect condition			**A necessary but not sufficient condition for equilibrium of the firm under perfect condition**
39	The condition of equilibrium of the industry under perfect competition is	MC = MR	MC = AC	MC = MR = AR	MC = AC = AR			**MC = AC = AR**
40	In the short-run, a competitive firm can earn	Normal profit	Super normal profit	Loss	Either A or B or C depending upon the level of average cost.			**Either A or B or C depending upon the level of average cost.**
41	If price is equal to average cost, in the short-run, the competitive firm can earn	Only normal profit	Super normal profit	Loss	All of the above			**Only normal profit**
42	If price is greater than average cost, in the short-run, the competitive firm can earn	Normal profit	Super normal profit	Loss	All of the above			**Super normal profit**
43	If price is less than average cost, in the short-run, the competitive firm can earn	Normal profit	Super normal profit	Loss	All of the above			**Loss**
44	Zero economic profit arises in the long run in the case of	Perfect competition	Monopoly	Monopolistic competition	Oligopoly			**Perfect competition**

45	Zero economic profit includes	Zero normal profit	Normal profit	Super normal profit	Average profit			**Normal profit**
46	Economic efficiency is achieved in the long run in the case of	Perfect competition	Monopoly	Monopolistic competition	Oligopoly			**Perfect competition**
47	Consumer surplus will be maximum in the case of	Perfect competition	Monopoly	Monopolistic competition	Oligopoly			**Perfect competition**
48	The optimum level of output for a perfectly competitive firm is given by the point where	MR equals AC	MR = MC	MR exceeds MC by the greatest amount	MR equals MC and MC is rising			**MR equals MC and MC is rising**
49	When the perfectly competitive firm and industry are both in long run equilibrium	P = MR = SMC = LMC	P = MR = SAC = LAC	P = MR =Lowest point on the LAC curve	All of the above			**All of the above**
50	When the Average revenue of the firm is greater than its average cost, the firm is earning	Super normal profit	normal profit	normal loss	normal revenue			**Super normal profit**
51	In perfect competition the selling cost is	zero	insignificant	very high	high			**zero**
52	_____ is a market situation where there are infinite number of sellers	oligopoly	Perfect competition	Duopoly	Monopoly			**Perfect competition**
53	_____ means the practice of selling the same commodity at different prices to different buyers	perfect market	Price discrimination	oligopoly	Duopoly			**Price discriminatio n**
54	In case of perfect competition, no of selling firm would be	Large	Single	Varied but too many	None of the above			**Large**
55	Which of the following is a characteristic of a perfectly competitive market?	Firms are price setters.	There are few sellers in the market.	Firms can exit and enter the market freely	All of the above are correct			**Firms can exit and enter the market freely**
56	When a perfectly competitive firm makes a decision to shut down, it is most likely that	price is below the minimum of average variable cost.	fixed costs exceed variable costs.	average fixed costs are rising.	marginal cost is above average variable cost			**price is below the minimum of average variable cost.**
57	In a perfectly competitive market, the process of entry or exit ends when	a.firms are operating with excess capacity.	firms are making zero economic profit.	firms experience decreasing marginal revenue	price is equal to marginal cost			**firms experience decreasing marginal revenue**

58	In the long run in perfect competition:	The price equals the total revenue	Firms are allocatively inefficient	Firms are productively efficient	The price equals total cost			**Firms are productively efficient**
59	In the short run firms in perfect competition will still produce provided:	The price covers average variable cost	The price covers variable costs	The price covers average fixed cost	The price covers fixed costs			**The price covers average variable cost**
60	For a perfectly competitive firm:	Total revenue is a straight line	Price is greater than marginal revenue	Price equals total revenue	Price equals total cost			**Total revenue is a straight line**

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UNIT - IV							
S.NO	**Question**	**OPTION A**	**OPTION B**	**OPTION C**	**OPTION D**		**Answer**
1	A firm and industry are one and the same under	Perfect competition	Duopoly	Oligopoly	Monopoly		**Monopoly**
2	For a monopoly, the industry demand curve is the firm's	Profit function	marginal revenue curve	supply curve	demand curve		**demand curve**
3	If the price elasticity of demand is greater than 1	Marginal revenue is zero	Total revenue decreases when the firm lowers its price	Marginal revenue is negative	Total revenue increases when the firm lowers its price		**Total revenue increases when the firm lowers its price**
4	A shift in supply will have a bigger effect on price than output if demand is	Income elastic	Income inelastic	Price elastic	Price inelastic		**Price elastic**
5	Assuming a downward sloping demand curve and upward sloping supply curve, a higher equilibrium price may be caused by:	A fall in demand	An increase in supply	Improvements in production techno	An increase in demand		**An increase in demand**
6	A movement along the supply curve may be caused by:	A change in technology	A change in the number of producers	A shift in demand	A change in costs		**A shift in demand**
7	A subsidy paid to producers	Shifts the supply curve	Shifts the demand curve	Leads to a contraction in supply	Leads to an extension of supply		**Shifts the supply curve**
8	Price discrimination is	Charging different prices to different customers because it costs the firm more to serve some customers than others	Changing the firm's price frequently to respond to market conditions	Charging different prices to differen	Charging the same price to all customers		**Charging different prices to different customers when the price differences are not based on cost differences.**
9	Both monopoly and monopolistic competition:	Maximize profit where MR = MC.	Have high concentration ratios	Use advertising to differentiate their	Have high barriers to entry		**Maximize profit where MR = MC.**
10	The following industry often is a monopoly --------- ------	Cigarette industry	Publishing industry	Drug industry	Electric power industry		**Electric power industry**
11	A market	Necessarily refers to a meeting place between buyers and sellers	Does not necessarily refer to a meeting place between buyers and sellers	Extends over the entire nation	Extends over a city		**Does not necessarily refer to a meeting place between buyers and sellers**
12	Average Revenue curve under monopoly is	Upward slopping	Downward slopping	Horizontal straight line	None of these		**Downward slopping**
13	If a positively sloped linear supply curve crosses the quantity axis, the elasticity of supply is	Inelastic	Elastic	Unitary elastic	Perfectly elastic		**Inelastic**

14	If a positively sloped linear supply curve passes through the origin, the elasticity of supply is	Inelastic	Elastic	Unitary elastic	Perfectly elastic		**Unitary elastic**
15	The horizontal supply curve parallel to quantity axis represents	Elastic supply	Inelastic supply	Perfectly elastic supply	Perfectly inelastic supply		**Perfectly elastic supply**
16	Which of the following Elasticities measure movement along a curve, rather than a shift in the curve	Price elasticity of demand	Income elasticity of demand	Cross elasticity of demand	None of the above		**Price elasticity of demand**
17	Which type of competition leads to maximum exploitation of consumer	Perfect competition	Monopoly	Monopolistic competition	Oligopoly		**Monopoly**
18	The demand for the product of a monopoly firm is	Inelastic	Elastic	Unitary elastic	Perfectly inelastic		**Elastic**
19	Which of the form of monopoly regulation is the most advantages to the consumer	Price control	Lump sum tax	Per unit tax	All of the above		**Price control**
20	The market in which there is a single seller is called	Oligopoly	Monopsony	Monopoly	None of the above		**Monopoly**
21	The demand for the product of a monopoly firm is	Inelastic	Elastic	Unitary elastic	Perfectly inelastic		**Elastic**
22	If the monopolist incurs loss in the short run, then in the long run	The monopolist go out of business	The monopolist will stay in the business	The monopolist break even	Any of the above		**Any of the above**
23	Which of the form of monopoly regulation is the most advantages to the consumer	Price control	Lump sum tax	Per unit tax	All of the above		**Price control**
24	The monopolist who is in	Short run equilibrium will also be in long run equilibrium	Long run equilibrium will also be in short run equilibrium	Long run equilibrium may or may n	None of the above		**Long run equilibrium will also be in short run equilibrium**
25	In long run the monopolist can earn abnormal profit because of	Blocked entry	High selling price	Low cost	Economies of scale		**Blocked entry**
26	Price discrimination under monopoly is of	One	Two	Three	Four		**Three**
27	The market in which there is a single seller is called	Oligopoly	Monopsony	Monopoly	None of the above		**Monopoly**
28	Monopsony refers to	Single seller	A few sellers	Single buyer	A few buyers		**Single buyer**
29	Discriminating monopoly is possible if two markets have	Differing elasticity of demand	Differing average cost	Same elasticity	Different average cost		**Differing elasticity of demand**
30	Monopolist can fix	Both price and output	Neither price and output	Either price and output	None of the above		**Either price and output**
31	A discrimination monopolist charges in a market	Lower prices if it has lower elasticity	Higher prices if it has lower elasticity	Lower prices if it has higher elastici	Cannot say		**Lower prices if it has lower elasticity**
32	A firm practicing price discrimination will be	Changing qualities of the product	Buying from the cheapest market	Buying from firms	Charging different prices in different markets		**Charging different prices in different markets**

33	The best level of output for the monopolist is	AC is minimum	TC=TR	TR and TC are parallel	TR is maximum		**TR and TC are parallel**
34	If the monopolist faces identical demand for his commodity in the two separate markets, by practicing third degree price discrimination	Will increase his TR and total profit	Can increase his TR and profit	Cannot increase his TR and profit	Will charge different prices in different market		**Cannot increase his TR and profit**
35	Under pure monopoly, there will be	No distinction between firm and industry	One firm no industry	No firm one industry	Very few firms		**No distinction between firm and industry**
36	Under monopoly, the equilibrium price is	Equal to MC	Less than MC	More than MC	Equal to AC		**More than MC**
37	Monopolist will not produce that portion of demand curve where the elasticity of demand	Equal to unity	Less than unity	Greater than zero	None of the above		**Less than unity**
38	The cross elasticity of demand for the monopolist product is	Very low	Moderate	High	Very high		**Very low**
39	Which of the following is known as the perfect price discrimination	First degree price discrimination	Second degree price discrimination	Third degree price discrimination	None of the above		**First degree price discrimination**
40	A monopolist usually earns	Economic profit	Only normal profit	Losses	Profit and losses		**Economic profit**
41	Price discrimination is possible	Under any market form	Only under monopoly	Only under monopolistic competitio	Only in perfect competition		**Only under monopoly**
42	Who introduced various types of price discrimination?	Alfred Marshall	Adam Smith	A C Pigou	J B Say		**A C Pigou**
43	In case of Monopoly, a firm in long run can have	Loss	Profit	Super normal profit	All of the above		**All of the above**
44	Concentration of monopoly is implemented under	FERA	MRTP	FEMA	None of the above		**MRTP**
45	Which of the following is a characteristic of pure monopoly?	One Seller Of the Product	Low Barriers to Entry	Close Substitute products	perfect information		**One Seller Of the Product**
46	Monopolies arise as a consequence of _____	patents	control over the supply of a basic input	franchise	capture the market		**control over the supply of a basic input**
47	Which of the following best defines price discrimination?	charging different prices on the basis of race	charging different prices for goods with different costs of production	charging different prices based on c	selling a certain product of given quality and cost per ur		**selling a certain product of given quality and cost per unit at different prices to different buyers**
48	Monopoly power achieved through patent right is called	legal monopoly	illegal monopoly	monopolistic power	dual monoploy		**legal monopoly**
49	in _____ there is no close substitutes for the product	monopoly	Duopoly	Oligopoly	perfect market		**monopoly**
50	_____have full control over supply of market	Duopoly	perfect market	monopoly	Oligopoly		**monopoly**
51	Entry or exit is restricted in	Duopoly	imperfect market	monopoly	perfect market		**monopoly**

52	_____monopoly means the control of entire output of a commodity for which there is no substitute by a single producer	differentiated	absolute	pure	imperfect		**absolute**
53	_____is a situation where single producer produces a commodity having only a remote substitute	simple monopoly	pure monopoly	private monopoly	public monoploy		**simple monopoly**
54	_____monopoly is a market structure where the monopolist charges different prices from different consumers for the same good at same time	absolute	discriminating	pure	bilateral		**discriminating**
55	monoploy power is the ability of the firm or group of firm to influence	market price	share	interest	dividend		**market price**
56	_____is a condition where there are many sellers but only one buyer	perfect market	monopsony	duopoly	oligopoly		**monopsony**
57	in monopoly shape of demand curve is _____	undefined	inelastic	elastic	restricted		**inelastic**
58	For a monopoly, the industry demand curve is the firm's	Profit function	marginal revenue curve	supply curve	demand curve		**demand curve**
59	A single-price monopoly charges the same price	even if the demand curve shifts	to all customers	even if its cost curves shift	the price equals the firm's marginal revenue		**to all customers**
60	If the price elasticity of demand is greater than 1	marginal revenue is zero	total revenue decreases when the firm lowers its price.	marginal revenue is negative	total revenue increases when the firm lowers its price		**total revenue increases when the firm lowers its price**

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UNIT - V								
S.NO	**QUESTION**	**OPTION A**	**OPTION B**	**OPTION C**	**OPTION D**			**ANSWER**
1	Who is the price-leader under oligopoly ?	any unit with efficient production capabilities	there is no firm that can be termed as price leader under oligopoly	the largest firm	the smallest firm			**there is no firm that can be termed as price leader under oligopoly**
2	In this one firm assumes the role of price leader and fixes the price of the product for the entire industry	Price leadership	Cartel	Kinked demand curve	None of these			**Price leadership**
3	Monopolies and oligopolies are	Price takers, as are competitive firms	Price takers, in contrast to competitive firms which are price makers	Price makers, in contrast to competitive firms which are price takers	Price makers, as are competitive firms			**Price makers, in contrast to competitive firms which are price takers**

4	In the long run, monopolistically competitive firms maximize profit at the output where	They earn zero economic profit	P = MC	Marginal cost = the minimum of the long-run average total cost curve	All of the above			**They earn zero economic profit**
5	Suppose that an economy wants to eliminate the resource waste associated with excess capacity in monopolistically competitive markets. Which of the following actions would achieve this goal?	Allow monopolistically competitive firms to create more significant barriers to entry	Encourage more competition in monopolistically competitive markets	Require all the firms in a given monopolistically competitive market to produce identical products	Require all the firms in a given monopolistically competitive market to charge the same price			**Require all the firms in a given monopolistically competitive market to produce identical products**
6	Which best describes a demand curve?	The quantity consumers would like to buy in an ideal world	The quantity consumers are willing to sell	The quantity consumers are willing and able to buy at each and every income all other things unchanged	The quantity consumers are willing and able to buy at each and every price all other things unchanged			**The quantity consumers are willing and able to buy at each and every price all other things unchanged**
7	An increase in price, all other things unchanged, leads to	Shift demand outwards	Shift demand inwards	A contraction of demand	An extension of demand			**A contraction of demand**

8	Which of the following characterizes monopolistic competition?	Many interdependent firms sell a homogeneous product.	A few firms produce a particular type of product	Many firms produce a particular type of product, but each maintains some independent control over its own price.	A few firms produce all of the market supply of a good.			**Many firms produce a particular type of product, but each maintains some independent control over its own price.**
9	Monopolistically competitive industries are characterized by:	Low concentration ratios	Low entry barriers	Independent production decisions	All of the above			**All of the above**
10	In monopolistic competition, a firm:	Has no market power	Captures significant economies of scale	Has a downward-sloping demand curve	Has a standardized product that all firms produce			**Has a downward-sloping demand curve**
11	If there are many firms in an industry producing goods that are similar but slightly different, this is an example of:	Perfect competition	Monopolistic competition	Oligopoly	Monopoly			**Monopolistic competition**
12	A major difference between monopoly and monopolistic competition is:	One maximizes profits by setting MR equal to MC	The number of firms in the market	One type of firm has market power, and the other does not	One has a downward-sloping demand curve, and the other does not			**The number of firms in the market**

13	Imperfect competition was introduced by	Marshall	Chamberlin	Keynes	None of these			**Chamberlin**
14	Entry into a market characterized by monopolistic competition is generally	Entirely blocked by existing firms	Very easy because few barriers exist	As difficult as in oligopoly	More difficult than entry into monopolized markets			**Very easy because few barriers exist**
15	Which of the following characterizes monopolistic competition?	Price leadership	Product differentiation	Price discrimination	Economies of scale			**Product differentiation**
16	Product differentiation refers to	Features that make one product appear different from competing products in the same market	Different prices for the same product in a certain market	The selling of identical products in different markets	The charging of different prices for the same product in different markets			**Features that make one product appear different from competing products in the same market**

17	Which of the following is an example of product differentiation?	Two bars of soap differ only in their label, but consumers pay 50 paisa more for the label they recognise	Sugar can be made from sugar beets or sugar cane which consumers cannot differentiate when looking at sugar.	Consumers substitute vans in place of cars because vans accommodate more passengers.	Some sawmills specialize in producing softwood and others specialize in producing hardwood, but the two types of wood are used for very different purposes.			**Two bars of soap differ only in their label, but consumers pay 50 paisa more for the label they recognize**.
18	Perfect competition and monopolistic competition are best distinguished by:	The degree of product differentiation	The long-run economic profits that are expected	The number of firms in the market	The ease of entry and exit			**The degree of product differentiation**
19	A monopolistically competitive firm can raise its price somewhat without fear of great change in unit sales because:	The demand for its product is typically very price-elastic.	Its demand curve is horizontal	Of product differentiation and brand loyalty	Of the gap in its marginal revenue curve			**Of product differentiation and brand loyalty**
20	In monopolistic competition, a firm's demand is tangent to the long-run average cost curve in the long run because:	Barriers to entry are very high.	Entry eliminates economic profit, and exit eliminates losses.	Advertising is ineffective in differentiating a product.	All of the above.			**Entry eliminates economic profit, and exit eliminates losses.**

21	A monopolist will never produce at a point where ----------	demand is price - inelastic	demand is price elastic	marginal cost is positive	marginal cost is increasing			**marginal cost is increasing**
22	Which one is not collusive oligopoly ----------	price leadership	market sharing cartel	price discrimination	price fixing cartel			**market sharing cartel**
23	In an oligopolistic market, there are ----------	a large number of sellers and few buyers	few sellers and few buyers	few sellers and large number of buyers	only one seller			**few sellers and large number of buyers**
24	The essential aspects of oligopoly is -----------	excess capacity	non-price competition	a large number of firms	mutual recognition of interdependence			**mutual recognition of interdependence**
25	The kinked demand curve in Sweezy oligopoly model emerges due to assumption that ----------	when one seller decreases or increases his price, others follow	when one seller decreases his price others follow him	when one sellers decreases his price others follow but when he increases his price others do not follow	When one seller increases his price others decrease their prices.			**when one sellers decreases his price others follow but when he increases his price others do not follow**
26	In case of oligopoly , number of firms is	larger	Infinite	One	Few			**Few**

27	Average revenue curve under imperfect competition is	Upward sloping	Downward sloping	Horizontal straight line	Vertical straight line			**Vertical straight line**
28	Marginal revenue curve under imperfect competition is	Upward sloping	Downward sloping	Horizontal straight line	Vertical straight line			**Vertical straight line**
29	A monopolistically competitive market is distinguished from perfect competition by the fact that	Few sellers	It has few buyers	It deals with differentiated products	None of the above			**It deals with differentiated products**
30	Excess capacity is a hallmark of	Perfect competition	Monopoly	Oligopoly	Monopolistic competition			**Monopolistic competition**
31	Monopolistically competitive firms	Are small in size	Have small share in the market	Are large in the size	Both A and B			**Both A and B**
32	Selling cost assumes paramount importance in	Perfect competition	Monopoly	Monopolistic competition	None of the above			**Monopolistic competition**
33	Under monopolistic competition, there can be freedom of entry in the sense that there is freedom to produce	Close substitutes	Perfect substitutes	Complements	None of the above			**Close substitutes**
34	A firm under monopolistic competition advertise because	To compete successfully with rival	To lower cost of production	To increase revenue and sales	Since it cannot raise price			**To increase revenue and sales**

35	In the case of monopolistic competition,	Short run supply curve cannot be defined	MR curve cannot be defined	AR curve cannot be defined	None of the above			**Short run supply curve cannot be defined**
36	Under monopolistic competition, super normal profit arise when	AR=AC	MR=MC	AR>AC	AR<AC			**AR>AC**
37	Which of the following condition are met in the long run equilibrium of the monopolistic competitor earning only normal profit	MC=AC	P=AC	P=MR	P=MC			**P=AC**
38	The term group equilibrium is referred to	Duopoly	Monopolistic competition	Perfect competition	Oligopoly			**Monopolistic competition**
39	It is assumed that the cost curves of all the firms in the monopolistic competition are	Different due to product differentiation	Never considered in equilibrium	Never formulated	Same in spite of product differentiation			**Same in spite of product differentiation**
40	Free entry into monopolistically competitive market ensures that all firms will produce at the lowest point of LAC	Always	Sometimes	Never	Cannot say			**Never**

41	Under monopolistic competition, the long run equilibrium of the firm is established at the	Minimum point of LAC	Point where LAC is still falling	Point where LAC is rising	Minimum point of LMC			**Point where LAC is still falling**
42	In short run a firms in monopolistic competition	Always earns profit	Incurs loss	Earns normal profit only	May earn normal profit, abnormal profit or incur losses			**May earn normal profit, abnormal profit or incur losses**
43	In long run all the firms in the monopolistic competition	Always earns profit	Incurs loss	Earns normal profit only	May earn normal profit, abnormal profit or incur losses			**Earns normal profit only**
44	The short run equilibrium level of output of the monopolistic competitor is given by	Price = MC	Price= AC	MC=MR	P=MR			**MC=MR**
45	When a group of monopolistic competition attains the equilibrium, the firms in the group	Charge different prices, but produce identical outputs	Produce different output, but charge the same price	Charge different price and produce different output	None of the above			**Produce different output, but charge the same price**
46	The elasticity of average revenue curve of the monopolistic competitor, depends on	The extent of product differentiation	The number of firms	Number of buyers	Both A & B			**Both A & B**

47	Under monopolistic competition, the demand curve of the product of an individual firm depends on the nature and prices of close substitutes	true	false	Not always	Depends on the nature of the product			**true**
48	When demand curve is elastic, MR is	One	zero	Positive	Negative			**Positive**
49	The best or optimum level of output for the pure monopolist	MR=MC	P=MC	P=AC	Highest P			**MR=MC**
50	Increase or decrease in the level of production by a monopolistically competitive firm have ------- impact on price and output decisions of other firms	Very significant	Significant	Small	Negligible			**Negligible**
51	Monopolistic competitive firm fixes the price of its product	Independent of the price of close substitutes	Close to the prices of close substitutes	At a very high level	None of the above			**Close to the prices of close substitutes**

52	Under monopolistic competition, an increase in the number of firms producing close substitutes will make the demand curve of each firm	Inelastic	Elastic	Downward sloping	Perfectly inelastic			**Elastic**
53	The demand curve faced by the a monopolistically competitive firm is very elastic if the degree of product differentiation is	Very low	Very high	Zero	Moderate			**Very high**
54	Which one of the following is not a feature of monopolistic competition	Homogeneous products	Differentiated products	Selling cost	No uniform prices			**Homogeneous products**
55	The book “The theory of Monopolistic Competition” is written by	Alfred Marshall	E H Chamberlin	Joan Robinson	J M Keynes			**E H Chamberlin**
56	The book “The Economics of Imperfect Competition” is written by	Alfred Marshall	E H Chamberlin	Joan Robinson	J M Keynes			**Joan Robinson**

57	'Indeterminateness of demand curve' is a feature of	Perfect competition	Monopoly	Monopolistic competition	Oligopoly			**Oligopoly**
58	The concept of 'Kinked demand curve' is related to	Monopoly	Monopolistic competition	Perfect competition	Oligopoly			**Oligopoly**
59	'Group behavior' is a feature of	Monopoly	Oligopoly	Perfect competition	Monopolistic competition			**Oligopoly**
60	Classical oligopoly models are related to	Collusive oligopoly	Price leadership model	Non-collusive oligopoly	None of the above			**Non-collusive oligopoly**