Importance of the Concept

1. The concept of consumer's surplus does emphasise the amenities that we enjoy in a modern society. Much of the consumer's surplus we enjoy depends on our surroundings and the opportunities of consumption available to us, *e.g.*, amenities of life in America as compared to Central Africa. It thus clarifies conjunctural importance. The concept enables us to compare the advantages of environment, and opportunities or conjunctural benefits. The larger the consumer's surplus, the better off are the people. The concept, thus, serves as an index of economic betterment.

2. It is useful in price policy of a monopoly firm. The monopolist can put a higher price on the goods if consumer's surplus is high, without causing any reduction in sales.

3. It is of significance to the exchequer in determining indirect taxation. The finance minister can easily levy more taxes where consumer's surplus is high.

4. By estimating the difference in consumer's surplus resulting from a change in price, we can know and compare the effects of a given change in the price of any commodity on the different classes of people. It is, therefore, widely adopted in welfare economics.

5. Gains from international trade can be measured in terms of consumer's surplus obtained in the imported goods.

DEMAND

In common parlance, "demand" is conceived as a desire to possess a particular thing. But, in economics, demand is not the same thing as desire or want. To an economist, however, demand is an effective desire (or want for a thing). Desire becomes effective demand when it is backed by ability and willingness to pay for the goods.

Further, demand is not an absolute term. It is a relative concept. Demand for a commodity should have always a reference to price and time.

Thus, demand may be defined as the amount of commodity purchased or desired (effectively) by a person at a given point of time, and at a given price. Beuham defines demand thus: "The demand for anything looked always at a given price, is the amount of it which will be bought per unit of time at that price."

As Lipsey points out, economists are "concerned not with a single isolated purchase, but with a continuous flow of purchases." Thus, in

economic studies, demand is expressed "as so much per period of time—one million oranges per day, say, or seven million oranges per week, or 365 million per year."

Determinants of Demand

The demand for a commodity is determined by many factors. An individual's demand for a commodity is determined by such factors as:

(i) The *price* of the product.
(ii) The *income* of the individual.
(iii) The individual's *habits* and *tastes* for the product.
(iv) The availability of substitutes and their comparative prices.

The individual demand for a product changes with a change in any one of these factors.

Factors Influencing Market Demand

The market demand for a commodity originates and is affected by the form and change in the general demand pattern of the community or the people at large. The following factors affect the common demand pattern for a commodity:

(a) The price of the product.
(b) The community's wealth and *per capita* income.
(c) The community's habits and scales of preference.
(d) Social and class attitude and the general standard of living of the community.
(e) Fashions and demonstration effect.
(f) Age structure and sex ratios of the population.
(g) Speculation about changes in further prices of the commodity.
(h) Level of taxation and the tax structure.
(i) Introduction of new goods, substitutes, etc., *i.e.* inventions and innovations.
(j) Advertisement and sales propaganda and the scale of preference.

When these factors change, the general demand pattern will be affected, causing a change in the market demand as a whole.

Demand Function and Demand Schedule

The function relationship between the demand for a commodity and its various determinants may be expressed mathematically in terms of a demand function, thus:

$$Dx = f(Px, Py, M, T, A, U)$$

where,

Dx = Quantity demanded for commodity x.
f = functional relation.
Px = The price of commodity x.
Py = The price of substitutes and complementary goods.
M = The money income of the consumer.
T = The tastes of the consumer.
A = The advertisement effect.
U = Unknown variables or influences.

The above-stated demand function is a complicated one. Again, factors like tastes and unknown influences are not quantifiable. Economists, therefore, adopt a very simple statement of demand function, assuming all other variables, except price, to be constant. Thus, an over-simplified and the most commonly stated demand function is : $Dx = f(Px)$, which connotes that the demand for commodity x is the function of its price. The traditional demand theory deals with this demand function specifically.

It must be noted that by demand, economists mean the entire functional relationship, *i.e.* the whole range of price-quantity relationship, and not just the amount demanded at a given price per unit of time. In other words, the statement, "the amount demanded is a function of price" implies that for every price there is a corresponding quantity demanded.

To put it differently, demand for a commodity means the entire demand schedule, which shows the varying amounts purchased at alternative prices at a given time. Table 3.7 represents a hypothetical demand schedule of an individual for the commodity x.

Table 3.7 :
An Individual Demand Schedule

Price of x (in Rs.) (Px)	Commodity x (in units) (Dx)
5	5
4	10
3	20
2	35
1	60

It will be noted that the demand schedule does not indicate any change in demand by the individual concerned, but merely expresses his present behaviour in purchasing the commodity at alternative prices. It shows only variation in demand at varying prices. Further, though the given demand schedule is purely hypothetical and a real demand schedule for any commodity is very difficult to estimate, it seeks to illustrate the principle that more of a commodity is demanded at a lower price than at a higher one. In fact, most of the demand schedules show an inverse relationship between price and quantity demanded.

Theoretically, the demand schedules of all individual consumers of a commodity can be compiled and combined to form a composite demand schedule, representing the total demand for the commodity at various alternative prices. The derivation of market demand from individual demand schedules is illustrated in Table 3.8. Here, it is assumed that the market is composed only of three buyers, A, B and C.

Table 3.8 :
A Market Demand Schedule

Price (in Rs.)	Amount of Commodity demanded per day by Individuals						Total or Market Demand
	A	+	B	+	C	=	
5	5		7		3	=	15
4	10		15		10	=	35
3	20		30		15	=	65
2	35		50		25	=	110
1	60		100		40	=	200

Usually, the demand schedule (whether of an individual or of a market) denotes an inverse functional relationship between price and quantity demanded. That is to say, when the price rises, demand tends to fall and *vice versa*. It refers to general tendency of the consumers that more will be bought at low prices and less will be bought at high prices. This tendency, as according to Marshall, is the fundamental law of demand.

THE LAW OF DEMAND

From the demand schedule, it is apparent that demand varies with price. There is an inverse relationship between the two, *i.e.* demand varies inversely with price. This relationship between the demand for a commodity and its price has been generalised as the law of demand.

The law may be stated thus : "Other things being equal, the higher the price of a commodity, the smaller is the quantity demanded and the lower the price, the larger the quantity demanded." In other words, the demand for a commodity *expands* (*i.e.* the demand rises) as the price falls and *contracts* (*i.e.* the demand falls) as the price rises. Or briefly stated, the law of demand stresses that demand varies inversely with price.

It is a universal fact that people would generally be willing to buy more of a commodity at a lower price than at a higher price and *vice versa*. This is what is meant by the expression that demand varies inversely with price. Thus, the law of demand may be expressed in

mathematical terms as : "Demand is a decreasing function of price" Symbolically, thus : $D = f(P)$ where D represents demand, and P the price, f connoting functional relationship.

The conventional law of demand, however, relates to the much simplified demand function : $D = f(P)$. It, however, assumes that rher determinants of demand are constant, and only price is the variable and influencing factor.

Thus, the law of demand involves the following *ceteris paribus* assumptions :

1. Tastes and preferences of the consumer remain constant.
2. Consumer's income is fixed and constant.
3. Prices of other goods like substitutes and complementaries remain constant.
4. The given price change for the commodity is a normal one; it is not speculative.
5. The size of population is unchanged. So also the sex rato and age structure remain undisturbed.
6. There is no change in the distribution of the community's income and wealth.
7. The level of taxation and other fiscal measures undergo no significant changes.
8. Climatic and weather conditions are unchanged in visualising the demand for certain goods like agricultural products.

The law of demand holds true only under these conditions.

Demand Curve

Usually, a demand curve is drawn to give a pictorial presentation of the law of demand. In fact, the graphical presentation of the demand schedule is called a demand curve. It represents the functional relationship between quantity demanded and price, *i.e.* $Dx = f(Px)$. The individual demand schedule for x can be represented by a demand curve as shown in Fig. 3.5. The x-axis measures the quantity demanded and the y-axis the price.

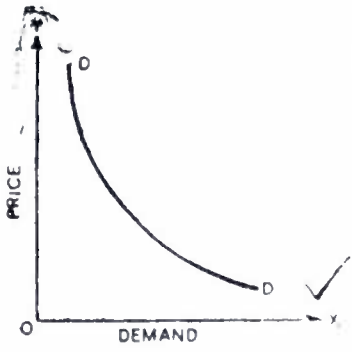

Fig. 3.5.

DD is the demand curve which has a negative slope, sloping downward from the left to the right, representing an inverse functional relationship between price and demand.

It is interesting to note certain characteristics of a typical demand curve as under :

1. The demand curve is drawn by joining the loci of points representing alternative amounts of the commodity demanded by the consumer per period of time at all relevant prices.

2. A demand curve may be linear or non-linear. This depends on the data obtained in compiling the demand schedule. A linear demand curve is always a straight line. A non-linear demand curve has a curvature.

3. Usually, a demand curve has a negative slope, which reflects the inverse relationship between price and quantity demanded. It thus shows that demand contracts with a rise in price, and when the price falls, there is an expansion of demand.

4. A particular point on the demand curve depicts specifically a single price-quantity relation. The entire range of the demand curve relates to a complete functional relationship between price and demand. Thus, the demand curve as a whole, and not its particular point, reflects the demand behaviour of the consumer in relation to all possible alternative price variations.

Exceptional Demand Curve

It is almost a universal phenomenon of the law of demand that when the price falls, the demand extends and it contracts when the price rises. But sometimes, it may observed, of course very rarely, that with a fall in price, demand also falls and with a rise in price, demand rises. In such cases, the demand curve will be unusual. It slopes upwards from left to right. It is rather known as an exceptional demand curve, as depicted in Fig. 3.6.

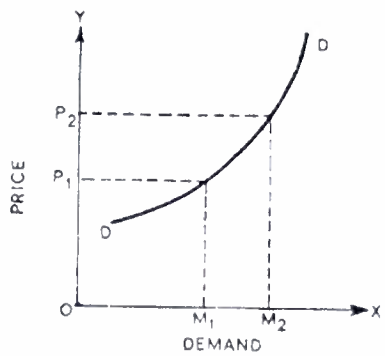

Fig. 3.6.

In Fig. 3.6, DD is the demand curve which slopes upward from left to right. It appears thus that when OP_1 is the price, OM_1 is the demand and when the price rises to OP_2 demand also extends to OM_2. Thus, the upward sloping demand curve expresses a functional relationship between price and demand.

Such upward sloping demand curves are unusual and quite contradictory to the law of demand as they represent the phenomenon that :

"more will be demanded at a higher price and *vice versa*." The upward sloping demand curve, thus, refers to the exceptions to the law of demand. There are a few such exceptional cases, which may be categorised as follows :

1. *Giffen Goods* : In the case of certain inferior goods called Giffen goods, when the price falls, quite often lesser quantity will be purchased than before because of the negative income effect and consumer's increasing preference for a superior commodity with a rise in their real income. Probably, a few appropriate examples of inferior goods may be listed, such as staple foodstuffs like cheap potatoes, cheap bread, pucca rice, vegetable ghees etc. as against superior commodities like good potatoes, cakes, Basmati rice, pure ghee.

2. *Articles of Snob Appeal* : Sometimes, certain commodities are demanded just because they happen to be expensive or prestige goods and have a "snob appeal". These are generally ostentatious articles, and purchased by only rich people which serve as a "status symbol." Thus, when the prices of such articles like diamonds, especially famous ones like Kohinoor diamond, rise, their demand also rises. And the rich people may stop buying such articles when they become common and their price is reduced. Thus, their demand contracts with a "fall in price".

3. *Speculation* : When people buy more quantity of a commodity in the belief that its price will rise in the future, they may not act according to the law of demand at the present. Say, when people are convinced that the price of a particular commodity will rise still further, they will not contract their demand with the given price rise; on the contrary, they may purchase more for the purpose of hoarding. The some is the case with shares on the stock exchange.

4. *Consumer's Psychological Bias or Illusion* : When the consumer is wrongly biased againt the quality of a commodity with the price change, he may contract his demand with a fall in price. It is the common experience of certain genuine sellers that such type of buyers do not purchase more in "Reduction Sales".

VARIATION AND CHANGE IN DEMAND

The expression "variation in demand" is connoted by the law of demand. A variation in demand implies extension or contraction of demand. When with a fall in price a commodity is bought, there is extension of demand. Similarly, when a lesser quantity is demanded with a rise in price, there is contraction of demand. In short, demand

extends when the price falls and it contracts when the price rises. Thus, demand *varies* with changes in price. This is based on the law of demand.

The terms "extension" and "contraction" of demand should, however, be distinguished from "increase" or "decrease" in demand. The former is used for indicating variation in demand, while the latter for denoting changes in demand. Variation in demand is the connotation of the law of demand. It expresses a functional relationship between demand and price. A change in demand due to a change in price is called extension or contraction. Extension and contraction refer to the same demand curve. A change in demand due to causes other than price is called increase or decrease in demand.

Changes in demand are, however, a result of the change in conditions or factors determining demand, other than price. A change in demand, thus, implies an increase or decrease in demand. When more of a commodity is bought than before at any given price, there is an *increase* in demand. Similarly, when, with the price remaining unchanged, less of a commodity is bought than before, there is a decrease in demand. In other words, an "increase" in demand signifies either that more will be demanded at a given price or the same will be demanded at a higher price. Thus, an increase in demand means that more is now demanded than before at each and every price. Likewise, a "decrease" in demand signifies either that less will be demanded at a given price on the same will be demanded lower price. Thus, decrease in demand means that less is now demanded than before at each and every rise in price. The increase and decrease in demand are shown on different demand curves.

In graphical exposition, "expansion" or "contraction" of demand is shown by the movement along a demand curve. A downward movement from one point to another on the same demand curve implies *extension* of demand, for instance, movement from *a* to *b* in Fig. 3.7. While an upward movement from one point to another on the same demand curve implies *contraction* of demand, *e.g.*, movement from *b* to *a* in the figure.

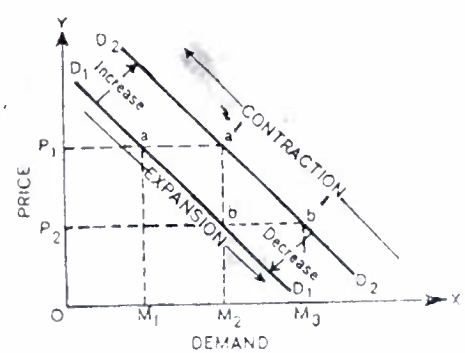

Fig. 3.7.

In short, a change in the quantity demanded in response to a change in price is explained by the terms "extension" or "contraction" of demand. Further, extension or contraction implies a movement on the same demand curve. It, thus, signifies that the demand schedule remains the same.

On the other hand, the terms "increase" and "decrease" in demand are graphically expressed by the movements from one demand curve to another. In other words, the change in demand is denoted by the shifting of the demand curve. In the case of an increase in demand, the demand curve is shifted to the right. In Fig. 3.7, thus, the movement of demand curve from D_1D_1 to D_2D_2 shows an increase in demand. In this case, the movement from point a to a^1 indicates that the price remains the same at P_1M_2, but more quantity is now demanded. Similarly, a decrease in demand is depicted by the the shifting of the demand curve towards its left. In the figure, thus, the movement of curve from D_2D_2 to D_1D_1 shows a decrease in demand. In this case, the movement from point b^1 to b, indicates that the price remains the same at OP_2, but less quantity is now demanded than before.

In short, a change in the quantity demanded due to a change in overall pattern of demand is a matter of increase or decrease in demand. For a change in demand, thus, the change in factors other than price is responsible.

We may now summarise the above discussion : extension or contraction in demand is caused by a change in price and occurs when there is no change in the basic conditions of demand. These are reflected through the upward and downward movements on the same demand curve. On the other hand, increase and decrease in demand are caused by the changes in the basic conditions of demand, the price remaining the same. These are depicted by a shift of the entire demand curve either to the right or left of the original curve.

Reasons for Change in Demand

A change in demand occurs when the basic conditions of demand change. Thus, an alteration in the demand pattern (or increase or a decrease in demand) is brought about by many kinds of changes. Some of the important changes are :

1. *Change in Income* : A change in the income of the consumer significantly influences his demand for most commodities. The demand for superior commodities in general and for comforts and luxury articles increases with a rise in the consumer's income. Similarly, the overall demand generally decreases with a fall in income.

2. *Change in Taste, Habit and Preference* : When there is a change in taste, habit or preference of the consumer, his demand will change. For instance, when a person gives up his smoking habit, his demand for cigarette decreases.

3. *Change in Fashions and Customs* : Many of our demands are determined by fashions and customs of our society. When these change, demand also changes. For instance, in Indian society due to western influence, the dhoti has largely disappeared and trousers have come into fashion, hence the demand for dhotis has decreased whereas that of trousers has increased.

4. *Change in the Distribution of Wealth* : Through fiscal measures, government can reduce inequality of income and wealth and bring about just distribution of wealth, so that the demand pattern changes in a dynamic welfare society. Welfare programmes like free medical aid, free education, pension schemes etc. raise the purchasing power of the poorer sections of the community and their standard of living, as a result of which the overall demand pattern may change.

5. *Change in Substitutes* : Changes in the supply of substitutes, change in their prices, the development of new and better quality substitutes certainly affect the demand pattern of a commodity. For instance, introduction of ball-point pen has caused a decrease in the demand for fountain pens.

6. *Change in Complementary Goods* : When there is a change in the supply or demand conditions of a complementary good (which is jointly demanded), there will be side-effects on the demand for the commodity in question. For instance, a change in the demand for shoes will automatically bring about a similar change in the demand for shoe-laces.

7. *Change in Population* : The market demand for a commodity substantially changes when there is a change in the total population or change in its age composition or sex composition. For instance, if the birth rate is high in a country, more toys and chocolates will be demanded. But when the birth rate is substantially reduced through overall family planning efforts, their demand will decrease. Similarly, if the sex ratio of the country changes and if females outnumber males, demand for skirts will increase and that for shirts will decrease.

8. *Change in the Value of Money* : When there are inflationary or deflationary tendencies developing in the general price level, so

that the value of money falls or rises, there may be changes in the relative price of different goods, causing widespread changes in the demand pattern of various items.

9. *Change in the Level of Taxation* : When the government changes its tax structure, especially that of direct taxes, the disposable income of the people increases, which causes changes in the overall demand. Therefore, high tariff duties are imposed by the government on imports to decrease the demand for foreign goods.

10. *Advertisement and Publicity Persuasion* : A clever and persistent advertisement and publicity programme by the producers affect consumer's preferences and cause alterations in the demand for products. Generally, demand for patent medicines and toilet articles is to a great extent determined by salesmanship and publicity.

11. *Expectation of Future Changes in Prices* : When the consumer expects that there will be a rise in prices in future, he may buy more at the present price and so his demand increases. In the reverse case, his demand decreases.

UTILITY ANALYSIS OF DEMAND

A theoretical explanation of consumer behaviour that more quantity is purchased (or demanded) as the price falls and *vice versa* is provided by Marshall in terms of the laws of diminishing marginal utility and equi-marginal utility. In other words, the law of demand is related to or based upon these laws.

I. The Law of Diminishing Marginal Utility and the Law of Demand

The relationship between demand and marginal utility can explain the behaviour of demand in relation to price and, thus, the demand curve. In fact, the law of demand is based on the law of diminishing marginal utility.

Individual Demand

According to the law of diminishing marginal utility, a consumer tries to equalise marginal utility of a commodity with its price so that his satisfaction is maximised.

Marshall assumes that a consumer is rational and always tries to seek maximum total utility when he buys goods. Marshall contends that a consumer always compares price with the marginal utility of the commodity. He is not willing to pay a price higher than the marginal utility in any case. *Thus, the price a consumer will be inclined to pay for a unit of a commodity will depend upon the marginal utility he expects to derive from it.* So, during the process of consumption, a consumer will be ready and willing to pay the highest price for the second and for the successive units, he will be inclined to

pay less and less. This is because his marginal utility of the commodity tends to diminish with an increase in the units of purchase.

At a given price, thus a consumer will buy that quantity of the commodity at which its marginal utility becomes equal to the price paid. It follows, thus, that the total of utility will be maximised and a consumer will reach an equilibrium point when the marginal utility of a commodity is equated with its price. In symbolic, thus:

$$MU_x = P_x$$

where, MU_x stands for the marginal utility of commodity X.

P_x stands for the price of X.

Suppose at a given price, the consumer purchases certain units of a commodity so that its marginal utility is equal to its price. Now if the price of the commodity falls, then with the given purchases, the consumer will find that marginal utility is greater than the price hence he will not be at equilibrium, as he is not maximising his satisfaction. Then, of course, to achieve equilibrium, he will have to reduce the marginal utility further till it equalises with the reduced price. According to the law of diminishing marginal utility, it is obvious that he can do so by purchasing more units of the commodity (for, as the stock of a commodity increases, its marginal utility diminishes). Thus, the consumer is induced to purchase more when the price falls. That is to say, demand extends with the fall in price.

Derivation of Demand Curve from the MU Curve

Thus, the law of demand is based on the law of diminishing marginal utility. The downward sloping demand curve, in fact, is derived from the marginal utility curve which is also sloping downward.

As a matter of fact, the demand curve and the marginal utility curve of a commodity are identical, because the demand function and marginal-utility functions are inter-related and both have the same characteristics.

In mathematical terms: (1)

$$D_x = F(P_x)$$

where, D_x = demand for

P_x = price of$_x$

F = functional relation.

The demand function is an inverse function as demand varies inversely with price.

$$MU_x = F(X) \qquad (2)$$

where, MU_x = marginal utility of X

X = amount of commodity X

The marginal utility function is also an inverse function, *i.e.* marginal utility diminishes when the amount of X increases.

The consumer's equilibrium, *i.e.* the point of satiation condition is : $MUx = Px$

Considering functions (1) and (2) here, it follows that : $MUx = Dx$ or $Dx = MUx$. In this way, marginal utility serves as the base for the demand for a commodity.

The derivation of demand curve from a given marginal utility curve is illustrated in Fig. 3.8.

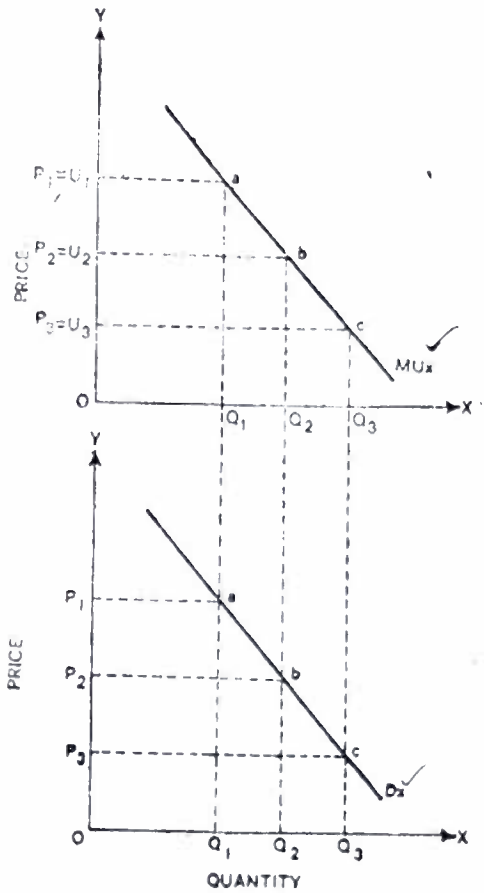

Fig. 3.8.

The upper panel of the diagram represents marginal utility curve (MUx) for the commodity X. The consumer attains equilibrium by equating marginal utility with price. Thus, at P_1 price he buys Q_1 of X so that $U_1 = P_1$. To measure this, plot the distance OP_1 of the lower panel on the upper panel of the diagram, so that $P_1 = U_1$ is obtained. In relation to U_1, we get point a on the MUx curve. By drawing a perpendicular at this point, Q_1 is obtained. Extend this further to the lower panel of the diagram. Now in the lower panel, point a is obtained in relation to P_1 and Q_1. The point a thus signifies price-quantity relation. Now, if the price falls to P_2 as plotted in the lower part of the diagram, the equilibrium condition of the consumer is disturbed ($\because U_1 > U_2$). Thus U_1 is to be lowered till it

becomes equal to P_2. To measure this, plot the distance OP_2 of the lower panel on the upper panel of the diagram. Thus $P_2 = U_2$ point is obtained. In the context, we get point b on the MUx curve. By drawing a perpendicular at this point, Q_2 is obtained on the x-axis. It is extended further to the lower panel of the diagram and point b is obtained again to show the price-demand relationship. Likewise, point c is obtained. In the lower panel of the diagram, thus by joining the locus of points a, b, c etc., we derive a downward sloping demand curve (Dx), which is nothing but a replica of the marginal utility curve (MUx).

Market Demand

In the case of market demand, at any time, there are a number of consumers with different estimates of the marginal utility of a commodity. Some may have high utility and some low utility. Further, no consumer is prepared to pay the price *for a commodity higher than its marginal utility*. Thus, only those individual whose estimate of the marginal utility of the commodity is high, will be prepared to pay a high price and will buy the commodity at a higher market price, but those who have a lower marginal utility for that commodity will not make purchases at the prevailing high market prices.

Moreover, there will be a group of persons called "marginal buyers" in the market for whom, at the ruling price, the marginal utility is just equal to the price, so that they are often on the margin of doubt whether to buy the commodity or to spend the money on some other commodity.

Thus, when the price falls:

(i) These marginal buyers will find that now the marginal utility is greater than the price so that they will definitely purchase the commodity.

(ii) Those buyers having a higher marginal utility will be induced to purchase more than before at the reduced price, in order to attain the equilibrium.

(iii) Those with a low marginal utility will now come forward to purchase the commodity as the low price will now tend to be equal to their estimate of marginal utility.

Thus, when the price falls, consumers with a high estimate of marginal utility will buy more than before and the marginal buyers as well as consumers with a low estimate of marginal utility will

come forward to purchase the commodity, and as a result the total demand for the commodity will rise.

This is how the market demand rises when the price falls, so that the market demand curve also has a negative slope to express this inverse relationship of price and demand.

II. The Law of Equi-marginal Utility and the Law of Demand

The behaviour of consumer's demand can also be explained with the help of the law of equi-marginal utility. According to this law, a consumer will be at equilibrium when $\frac{MUx}{Px} = \frac{MUy}{Py}$ etc. (*i.e.* the ratio of marginal utilities and price is equalised) in purchasing the various commodities. Now suppose, the price of x is reduced (falls), then the equilibrium condition will be disturbed and we may find that $\frac{MUx}{Px} > \frac{MUy}{Py}$. Hence, in order to attain equilibrium again, the consumer will have to reduce his marginal utility (MU) of X and increase the MU of Y to some extent till both the ratios are equalised. As such he will have to purchase more units of X and less of Y. That means, he will substitute commodity X for Y when the price of X falls, till the ratios of marginal utilities and price of these commodities are equalised again, *i.e.* $\frac{MUx}{Px} = \frac{MUy}{Py}$. This type of consumer's behaviour with a price change of a commodity is technically expressed by Marshall as "the substitution effect" and the "income effect" of price change.

Substitution Effect

According to Marshall, when the price of a commodity falls, the consumer is induced to substitute more of the relatively cheaper commodity (one whose price has fallen) to the dearer one (whose price has remain unchanged). Because, when the price of a commodity falls, the consumer's marginal utility for that commodity becomes comparatively high. Hence to increase his total satisfaction he finds it worthwhile to purchase more of the cheaper commodity as against the dearer one. This is the most common psychological attitude of every consumer. Since substitution effect is always positive, a lager quantity of the commodity will be purchased at a lower price.

Income Effect

This refers to the changes in the real income of the consumer due to the changes in price. When the price of a commodity falls, the

purchasing power or the real income of the consumer will rise, *i.e.* the consumer can now purchase the same amount of commodity with less money or he can now purchase more with the same money.

Income effect may, however, be positive, negative or zero. When a commodity has relatively a higher marginal utility, the income effect will be positive such that the surplus amount realised due to the fall in price of the commodity may be spent on the same commodity. The income effect is said to be zero if the entire surplus income realise due to the fall in price is spent on some other commodity. Likewise, the income effect may be negative when the quantity purchased is less than before with a fall in the price of a given commodity. This generally happens in the case of inferior goods and this phenomenon is described as the Giffen's Paradox. In the case of inferior goods, thus, when the price falls, demand also falls.

Now, if both income effect and substitution effect are positive, then the consumer will be induced to buy more with a fall in the price of a commodity. Even when the income effect is negative, and if the substitution effect is relatively so forceful that it outweighs the negative income effect, the consumer will demand more at the falling price.

Thus, it may well be concluded that normally when the price of a commodity falls, its demand rises and *vice versa*.

Basic Assumptions

The basic premises underlying the Marshallian theory of demand may, however, be enlisted as under :

1. Utility is measurable in cardinal terms, *i.e.* quantitively. In fact, Marshall measured utility of a commodity in hypothetical units termed 'units.'

2. Utilities of goods are independent. This means, utility of a commodity experienced by a consumer depends on its quantity only and it bears no influence of any other commodity.

3. The concept of utility is additive. This means, though each commodity has its independent utility, utilities of all goods can be added together and thereby the sum total of utilities can be obtained.

4. Being a subjective phenomenon, utility depends on the preferences, habits, tastes and income of the consumer. All these do

not vary, Marshall presented a set of cardinal utility schedules relating to the marginal utilities of the goods the consumer intends to buy.

5. Marshall adopted an introspective method of analysis to observe the consumer's experience about marginal utility. What is introspection can best be explained by quoting Professor Emil Kander : "Introspection is the ability of the observer to reconstruct events which go on, in the mind of another person, with the help of self-observation. This form of comprehension may be just guesswork or intuition or the result of long-lasting experience." Thus, under the introspective method, by observing his own behaviour or by making his own mental experiment, the economist tends to draw conclusions or made inferences about the behaviour of others. Thus, under the introspective method of analysis, the economist has to use his sharp common sense and make psychological reading of man's economic behaviour. Marshall's law of diminishing marginal utility is derived from such introspective or psychological reading of an imaginary consumer's mind.

6. Marshall not only assumed that the consumer has a fixed income but that marginal utility of his money income is also constant. Thus, when a consumer spends a part of his income on some goods, his remaining money income also has the same marginal utility as that of his total income.

7. The consumer is rational. The fundamental motivational basis of his demand behaviour is the maximisation of total utility.

CRITICAL EVALUATION OF MARSHALLIAN UTILITY ANALYSIS OF DEMAND

Marshall's utility approach to the theory of demand is systematic and logically perfect. Most of the modern economists, however, do not have much faith in his utility analysis on his grounds both of theory and operational efficiency. It has been discarded on the ground of having been derived from faulty assumptions. Professor Hicks is a firm critic of some of the utility analysis.

Following are Marshall's important criticism levelled against Marshall's marginal utility approach:

1. Marshall assumes that utility is measurable cardinally, *i.e.* quantitatively. Critics, however, point out that utility is a subjective and abstract term which can neither be measured nor expressed quantitatively. Thus, utility being cardinally non-measurable, the theory of demand based on that assumption appears to be vague.

In fact, the proportionality rule of equi-marginal utility for maximising satisfaction is impracticable and meaningless, as ratios like $\frac{MUx}{Px}$ etc. cannot be obtained when MUx cannot be numerically measured or expressed.

2. Since utility cannot be measured quantitatively, it is wrong to assume that the concept of utility is additive. Again, Marshall assumes that utility or satisfaction derived from different goods is qualitatively homogeneous. He, thus, considers only the difference belonging to a homogeneous group, which can be easily added together. This is incorrect. Actually, different goods give different kinds of satisfaction. The satisfaction derived by seeing a movie cannot, obviously, be the same as that would be derived from a bus-journey, or breakfast and snacks are not equal substitutes for a square meal. Heterogeneous units of satisfaction cannot be added together.

In short, an abstact term like utility can neither have numerical data (*i.e.* schedule as produced by Marshall), nor of any possibility of analytical process of addition or subtraction.

3. The utility analysis assumes that utilities are independent. This is not true. Actually, utilities of different goods are interlinked. Thus, the satisfaction derived from the consumption of one commodity is directly or indirectly influenced by the satisfaction derived from related goods. The goods, in fact, are complementary or substitutes to each other. Complementary goods are taken together. Substitute goods are used in place of one another. The utility variation in different combinations of goods is also not visualised in the Marshallian analysis. This is because, in his marginal utility analysis, Marshall constructed only a single commodity model by considering substitutes and complementaries as equals. As such, he did not give any thought to the cross effects of substitutes and complementaries.

Marshall assumes that marginal utility of money remains constant. Hicks argues that money is also a commodity and its marginal utility also diminishes slowly. Thus, the Marshallian assumption of constancy of marginal utility of money is not acceptable.

5. The utility analysis is incapable of exploring the demand for indivisible or bulky goods like T.V. Sets, Refrigerators, houses etc. Normally, a person would buy only a single unit of such goods, hence it is ridiculous to compile an individual demand schedule for

such goods. Only the market demand schedule of such goods can be composed. Thus, the utility theory fails to examine individual consumption behaviour in all cases. As such, it has a limited scope.

6. The utility analysis does not analyse the price effect completely. Marshall talked of substitution effect implied in the process of proportionality rule associated with the law of equi-marginal utility; but he neglected the impact of income caused by a price change. In fact, when the price of a commodity falls, the real income of the consumer rises as he has to spend less than before to buy the same amount of goods, the price of which has fallen. Similarly, when the price rises, the real income of the consumer decreases. This income effect may be positive, zero or negative. A positive income effect induces a person to spend the surplus money income (when the price of a commodity falls) on the same commodity (the price of which has fallen). Thus, a consumer may be induced to buy more by the positive income effect. This point is missed in the Marshallian utility analysis.

7. Again, the utility approach fails to clarify the typical cases of inferior and Giffen products. Specially in Giffen goods, there is a paradoxical situation in which the consumer tends to buy less of such goods when their prices fall. Marshall treated them as a case of exceptional demand curve which slopes upward. But, no clear and convincing reasoning has been furnished to explain the mystery of this paradox. This is because the utility theory neglets the analysis of income effect, which may be positive or negative. Since Marshall assumes constant marginal utility of money, he could not visualise the truly composite character of the unduly simplified price-demand relationship.

8. In short, the utility theory is not perfectly analytical as it does not analyse the distinction between income effect and substitution effect, which together compose the price effect—the effect of a change in the price of a commodity under consideration. Hicks, thus, remarks that it is an empty box crying out to be filled. He, therefore, makes an attempt to fill up this empty box—the analysis of distinction between 'income' and 'substitution' effects—by developing a technique of indifference analysis.

9. Finally, the marginal utility approach is based on an introspective method of analysis. Thus, it is not based on empirical findings. Again, utility being abstract and incapable of being measured quantitatively, it is not open to empirical tests.

SUMMARY

1. Utility is the want satisfying power of a commodity.

2. Total utility is the aggregate of satisfaction from the given stock of commodity consumed or possessed at a time.

3. The change in total utility resulting from one unit change in the stock of a given commodity per unit of time is called marginal utility. Symbolically,

$$MUx = \frac{dUx}{dQx}.$$

4. Marginal utility of a commodity varies inversely with a change in its quantity.

5. The law of diminishing marginal utility is based on the conditions of homogeneity, constancy, continuity, reasonableness and rationality.

6. The law of diminishing marginal utility is universally applicable. It applies to all goods, all consumers, at all places and at all times.

7. A consumer equates the price of a commodity with its marginal utility.

8. The proportionality rule:

$$\frac{\text{Marginal Utility of } a}{\text{Price of } a} = \frac{\text{Marginal Utility of } b}{\text{Price of } b}$$

$$= \frac{\text{Marginal Utility of } c}{\text{Price of } c} = \text{Marginal Utility of Money.}$$

9. Consumer's surplus refers to the surplus of satisfaction derived by a consumer in buying a commodity.

10. Consumer's surplus = Total utility — (Price × Quantity).

11. Concept of consumer's surplus has practical significance in clarifying conjunctural importance, in taxation policy, in pricing policy, in determining gains from foreign trade, etc.

12. According to the Law of Demand, other things being equal, when the price of a commodity rises, its demand falls and *vice versa*.

13. Usually, the demand curve slopes downward from left to right. It indicates an inverse functional relationship between price and demand.

14. An upward sloping demand curve is an exceptional demand curve.

15. Exceptions to the law of demand are: Giffen goods, articles of snob appeal, speculative behaviour of the consumer and his illusion regarding price, quality, etc., of a commodity.

16. Extension of demand refers to the increase in quantity demanded with a decrease in price. Increase in demand, on the other hand, means more quantity demanded of a commodity than before at the same price. Similarly, contraction of demand means decrease in the quantity of demand due to an increase in price. Decrease in demand, on the other hand, means less quantity demanded than before at the same price.

17. Changes in demand are caused by (i) change in income; (ii) change in consumer's tastes, habits and preferences; (iii) change in fashions and customs; (iv) change in the prices of substitutes; (v) change in population, in age structure and sex ratio; (vi) inflation, deflation; (vii) change in the level of taxation, etc.

18. Marshall bases the law of demand upon the law of diminishing marginal utility and the law of equi-marginal utility.

19. Basic premises of the utility theory are:
    (i) Utility can be measured cardinally.
    (ii) Utilities are independent.
    (iii) Utility is additive.
    (iv) A rational consumer always aims at maximisation of total utility.

20. Major points of criticism against utility analysis are:
    (i) Utility cannot be measured cardinally.
    (ii) Utility cannot be quantified, so it is not additive.
    (iii) Utilities are not independent but inter-linked.
    (iv) Utility analysis does not distinguish between 'income' and 'substitution' effect of a price change.
    (v) It fails to explain the Giffen's paradox.
    (vi) It is not open to empirical test.

EXERCISES

3.1 Critically examine the Law of Diminishing Marginal Utility.

3.2 (a) How are "Total Utility" and "Marginal Utility" related?
    (b) What is the importance of "marginal utility" in the theory of consumer's equilibrium?

3.3 Write notes on:

(i) Exceptions to the law of diminishing utility. (ii) Law of equi-marginal utility. (iii) Consumer's surplus.

3.4 Fill the gap by choosing the appropriate word:
    (1) When units of consumption of a good increases successively, its marginal utility———(rises/diminishes).
    (2) Total utility is maximum when marginal utility is———(high/zero).
    (3) A consumer equates marginal utility with———(price/money).

3.5 Show how a consumer should allocate a given sum of money to different items of expenditure so as to attain a position of equilibrium.

3.6 Explain how the principle of substitution helps a consumer to obtain equilibrium in the disposal of his income.

3.7 A consumer wants to spend Rs. 100/- to buy commodities X, Y and Z. The prices of these goods are, X Rs. 30, Y Rs. 20 and X Rs. 10 per unit. With the following schedule of marginal utilities, determine his optimum allocation of expenditure and measure the total utility so derived.

Schedule of Marginal Utilities

Units	1	2	3	4	5	6
Good X:	240	200	140	60	20	10
Good Y:	180	160	120	60	20	5
Good Z:	100	95	80	60	20	10

3.8 (a) What do you understand by consumer's surplus? How is it measured?
    (b) What is the utility of this concept?

CHAPTER 4

Indifference Curve Analysis

The technique of indifference curves was originated by Edgeworth in 1881 and its refinement was effected by Pareto, an Italian economist in 1906. This technique, however, received perfection and systematic application in the demand analysis at the hands of J. R. Hicks and R. G. D. Allen in 1934. Hicks, in fact, expounded and popularised the innovation of the indifference curve approach to the theory of demand in his *Value and Capital* published in 1939.

Indifference curves have been devised to represent the ordinal measurement of utility.

Ordinal Utility : Scale of Preference

In ordinal sense, utility is viewed as the *level* of satisfaction rather than *amount* of satisfaction. The level of satisfaction is relatively comparable but not quantifiable. Hicks mentions that it is possible to observe from experience and experiment the preferences which consumers display when choosing between different goods. He, however, asserts that people are not interested in any one commodity at a time as assumed by the marginal utility approach. Generally, consumers are, at a time, interested in a number of commodities, and the satisfaction resulting from their combinations. Besides, they can always compare the level of satisfaction yielded by one particular combination of goods with that of another combination. In fact, the level of satisfaction is a function of increasing the stock of goods. A larger stock of goods, apparently, yields a higher level of satisfaction than what a smaller stock of goods would yield. As such, different levels of satisfaction yielded by different stocks of goods can be visualised and compared but their differences cannot be measured in precise quantity. A rational consumer, obviously, prefers that stock or combination of goods which yield higher level of satisfaction than the one which yields a lower one. Thus, the consumer can conceptually arrange goods and their combinations in order of their significance or the level of satisfaction. This conceptual (mental) arrangement

of combination of goods and services set in order of the level of significance is called *scale of preference*.

The scale of preference indicates consumer's ordinal utility preference. It is independent of the consumer's income and also the prices of goods. It is just based on the mental assessment of the consumer regarding the capacity of given goods and services to satisfy his wants. In other words, the scale of preference is based on individual's likes and dislikes, tastes, habits and choices.

Indifference Schedule

When a consumer lays down his scale of preference about different combinations of certain goods under consideration, he will rank them as per the higher and the lower level of satisfaction visualised in them. A combination which is estimated to give the highest level of satisfaction will be assigned the first order preference. The combination yielding comparatively lower level of satisfaction will be assigned the second order preference. The one yielding a still lower degree of satisfaction is assigned the third order of preference and so on. However, the consumer might come across some combinations which yield the same level of satisfaction to him, so that he prefers them equally from a given order of preference. In such a case, he is said to be indifferent to such combinations of goods. The indifference curve analysis uses this concept of equal satisfaction as its base. This implies that a person has no specific preference between two or more sets of combination of goods as he finds them equally significant. Hence, he will be indifferent to these alternatives. Hicks opines that by experimenting, it is possible to discover such equal satisfaction yielding combinations of goods.

Thus, in the schedule of preference laid down by a consumer, we may come across certain combinations of goods under consideration for which he visualises equal satisfaction. Consequently, he will not be in a position to distinguish his preference between them and will be indifferent to these combinations as all these will be equally prefered at given rank of preference. Indeed, a consumer is said to be indifferent to varioue sets of combination of given goods when he experiences the same level of satisfaction or he finds the same position in his scale of preference for those sets of goods. A list of such combinations of given goods to a consumer which yields equal satisfaction at given level constitutes an *indifference schedule*.

While preparing an indifference schedule, one can think of combinations of numerous commodities which yield the same level of satis-

faction to the consumer. But later on for the sake of simplicity and geometrical convenience, we may consider groups of only two commodities in the course of our analysis. We may, thus, take two goods say, apples and bananas into consideration for our hypothetical consumer. We assume that the following combinations of these goods yield equal level of satisfaction to him, hence an indifference schedule is composed accordingly (See Table 4.1)

Table 4.1

Combination	Apples (*X*)	Bananas (*Y*)
a.	1	12
b.	2	8
c.	3	5
d.	4	3
e.	5	2

Since, by definition, all these combinations give him the same level of satisfaction, the consumer is indifferent to any of these combinations whether he gets a, or b, or c, or d, or e. He will neither be better off nor worse off whichever combination he chooses.

It must be remembered that an indifference schedule represents a part of consumer's "scale of preference." The scale of preference about combination of goods will constitute different ranks of preferences of given combinations, whereas, at a given rank, there may be certain combinations that may be yielding equal satisfaction. An indifference scheduled represents only equal satisfaction combinations at a particular order of preference, while a scale preference represents all combinations yielding different as well as equal levels of satisfaction.

INDIFFERENCE CURVE

The Indifference curve is a geometrical device representing all such combinations of two goods yielding equal satisfaction of a particular level. While plotting an indifference curve, however, it is assumed that the consumer is able to give sufficient information and the goods are perfectly divisible, so that we have infinite number of combinations of given goods (apples and bananas in our illustration) yielding the same level of satisfaction. Thus, by graphically plotting all such combinations and joining their loci points we derive an indifference curve as illustrated in Fig 4.1.

In Fig. 4.1, apples and bananas are measured along the *x*-axis and the *y*-axis, respectively. *IC* is the indifference curve derived on the basis of indifference schedule (in Table 4.1). Thus, an indifference