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Managerial Economics

Definition and Concepts

- The study of economic theories, econometric models and tools of analysis that help the managers in understanding the market behaviour for taking business decisions.
- It help the producers to make decisions regarding choice of product to produce, market segment to cater, deciding on the price and strategy for beating competition.
- “It is concerned with the application of economic concepts to the problems of formulating rational decision making”—**Mansfield**.

Highlights

- ◆ Demand
- ◆ Utility
- ◆ Indifference curve and map
- ◆ Budget line/price line
- ◆ Isocost line/price line/outlay line
- ◆ Market Structures
- ◆ Break-even Analysis
- ◆ Methods of evaluating Investment Returns
- ◆ Capital Budgeting Decision

Nature of Managerial Economics

- It is considered as a study helpful in taking decisions of a firm related to economy.
- It is “micro-economic” in character *i.e.*, related to a firm.
- It is goal oriented-profit maximization by optimal use of resources.
- It is conceptual as well as empirical.

Scope of Managerial Economics

- **Demand analysis and forecasting**—for making choice of business *i.e.*, what to produce and how much to produce.
- **Cost analysis** — choosing the factors of production.
- **Pricing theories** — to decide price in the market.
- **Profit analysis** — to find break even point.
- **Capital budgeting** — for investment decisions.
- **Competition in the market** — for deciding business strategy.
- **Business environment**—impact of macro environment on firm.

Functions of Managerial Economics

- Identifying business problems related to resource allocation
- Pricing problem
- Inventory and queuing problem
- Investment problems

Demand

- Demand for a commodity refers to the quantity of the commodity which an individual person is willing to buy at a particular price at a specific time.
- Demand is made up of desirousness to buy, willingness to pay for it, and ability to pay its price. This is individual demand. Thus, demand is a function of price.

- **Market demand** It is the sum of all the individual demands for a commodity in the market.
- Management decisions relating to production, cost allocation, pricing, advertising, budgeting, etc call for an analysis of the market demand for its firms product.

Types of Demands

- **Individual demand** Demand by a single customer.
- **Market demand** Summation of all individual demands.
- **Industry demand** Total demand for a commodity produced by all the firms constituting that industry is called the industry demand like demand for all kinds of cars.
- **Short-run demand** Demand for goods over a short period like fashion goods, seasonal goods.
- **Long-run demand** Refers to the demand which exists over a long period. Most generic goods (FMCG and consumer durables) have long-term demand.
- **Autonomous demand** Also called as direct demand, is one that arises on its own out of a natural desire to purchase. It is independent of demand for any other commodity like demand for food, cloth, house, etc.
- **Derived demand** It arose because of the demand for some other commodity, like demand for house is autonomous demand. Demand for cement, bricks and iron is derived demand, derived from construction needs.
- **Demand for durable goods** Goods whose usefulness is not exhausted in a single use. They can be used repeatedly like TV, clothes, shoes, cars, electronic goods.
- **Demand for non-durable goods** Non-durable goods are those which can be consumed only once in a very short time. All foods items, drinks, cosmetics, fall in this category. They are perishable in nature.

Utility

- It is the basis for demand of a commodity by individual.
- **Product utility** It satisfies the requirements of a consumer
- **Consumer's utility** Psychological feeling of pleasure from its consumption to a consumer. It is a post consumption phenomenon.

Consumer's Utility

It is a subjective concept which depends totally on the consumer who consumes it because

- product has utility to actual consumer only. Meat has no utility to vegetarians.
- utility varies from time to time - woollens have utility in winters and no utility in summers.
- a commodity need not have same utility for same consumer at different times.

Total Utility (TU)

Summation of the utilities derived by a consumer from the various units of a good at a point or over a period of time.

Marginal Utility (MU)

- It may be defined as the addition of an extra utility to the total utility resulting from the consumption of one additional unit. Thus, utility derived from last unit consumed can be measured by change in total utility. It is proposed by **Alfred Marshall**. Suppose marginal unit is n^{th} unit. Therefore,

$$MU_n = TU_n - TU_{n-1} = \frac{\Delta TU_n}{\Delta Q_n}$$

Where MU_n is marginal utility for n^{th} unit, ΔQ_n is change in quantity consumed by one unit, and ΔTU_n is change in total utility.

Law of Diminishing Marginal Utility

Also called as the "Gossen's First Law", proposed by **Hermann Heinrich** in 1854.

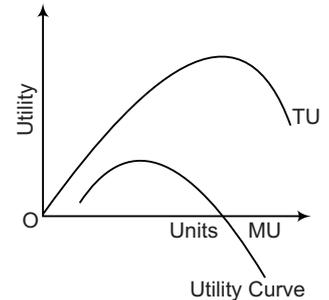
- States that the marginal utility (MU) of a good diminishes as an individual consumes more and more units of a good. The extra utility or satisfaction that he derives from an extra unit consumed goes on falling.

Managerial Economics

- It is only the MU that declines and not the Total Utility (TU) that is increasing but at a decreasing rate.
- This law of diminishing MU is based on two facts

As an individual consumes more and more units of a good, intensity of his want for goods goes on falling and a point is reached where the individual no longer wants any more units of the good. That is, when saturation point is reached, MU of a good becomes zero, afterwards it can be negative. *Second fact* is that the different goods are not perfect substitutes for each other, in the satisfaction of other particular wants. It is consumed for satisfaction of only one specific want.

- Money is an exception. MU of money is never zero or negative since it can be put to various uses for satisfying different wants.
- Law of diminishing MU is one important cause for the demand curve to slope downward.



Conditions Where Law of Diminishing MU applies are

- Units of the commodity should be consumed continuously in succession at one particular time.
- There should not be any changes in the taste, fashions, lifestyles, customs of the consumer. Mental stage should be same.
- All units of commodity should be homogenous in features.
- Prices of all units of commodity and their substitutes should remain the same.

Law of Equi-marginal Utility

- Also known as law of substitutions, law of maximum satisfaction and Gossen's Second Law.
- Law of equi-marginal utility explains the consumer's equilibrium. A consumer has a given income which he has to spend on various goods he wants. Now, how will he allocate his money between various goods. What would be his equilibrium position in respect of the purchases of various goods?
- Law of equi-marginal utility depends on the MU of goods and the price of the goods. These two factors decide the buying behaviour of a consumer.
- This Gossen's Second Law of substitution states that the "Consumer will spend his money on different goods in such a way that marginal utility of each good is proportional to its price." That is, if consumer has two goods X and Y to consume. He will be in equilibrium where

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y} = MU_m$$

- Where, MU_x is marginal utility of good x, MU_y is marginal utility of good y, P_x is price of good x, P_y is price of good y.
- MU_m is marginal utility of money *i.e.*, last rupee spent on consumption.
- If suppose MU_x / P_x is not equal to, but is greater than MU_y / P_y , then the consumer will substitute good X for good Y. As a result MU of X will fall and MU of Y will rise.

Cardinal Utility

- Classical economists like Carl Menger, Jeremy Bentham, Leon Walras and neo-classical economists like Alfred Marshall believed that utility can be measured in quantitative figures just as height and weight. It gives absolute figures of utility.
- Neo-classical economists coined the term "*util*" to measure the utility of any good consumed. Thus "*util*" is a unit of utility. They assumed that **1 util = 1 unit of money** and that utility of money remains constant.

Assumptions of Cardinal Utility Theory

- Rationality** It is assumed that consumer is rational in nature, he will spend his money on that commodity first which yields the highest utility and the last which gives the least utility.
- Limited money income of a consumer to spend on goods.
- Consumer tries to maximize his satisfaction on spending.
- It is assumed that the utility gained from the successive units of a commodity consumed, decreases as a person consumes them.
- Marginal utility of money remains constant, whatever be the level of a consumers income.

Utility is additive $U_n = Ux_1 + Ux_2 + \dots + Ux_n$

Ordinal Utility

- Modern economists like **JR Hicks** and **RGD Allen** are of the view that utility cannot be measured in absolute figures. Utility can be expressed only ordinally *i.e.*, in order of their preferability.
- This is known as ordinal concept *i.e.*, a consumer may not be able to say that chocolate gives 8 utils of satisfaction and cake give 12 utils of pleasure. But, he or she can always tell whether chocolate gives more or less utility than cake. This is the basis of ordinal theory of consumer behaviour.
- Cardinal utility approach can be called as Neo-classical approach.
- Ordinal utility approach of Hicks and Allen can be called as the Indifference curve analysis.
- Cardinalists used “money” as a measure of utility in absolute terms.

Assumptions of Ordinal Utility Theory

- Rationality** Aim of maximizing total satisfaction.
- Ordinal utility** Consumer is only able to express the order of his preference for different products.
- Transitivity of choice** If a consumer prefers A to B and B to C, then he will prefer A to C.
- Consistency of choice** If a consumer prefers A to B in one period, he does not prefer B to A in another period or even will not treat A equals to B.
- Diminishing marginal rate of substitution of one good for another shown by $D_y D_x$ This approach assumes that $D_y D_x$ goes on decreasing when a consumer continues to substitute X for Y.

Indifference Curve

- JR Hicks presented this concept in his book ‘**Value and Capital**’ in 1939 and its another work “A Revision of Demand Theory” in 1956, along with R Allen
- According to indifference curve analysis, utility being a psychological feeling is not quantifiable. It can be preferred.
- Indifference curve may be defined as the locus of points each representing a different combination of two substitute goods, which yield the same utility to the consumer. Such a situation is possible because consumer has a large number of goods to consume and that one commodity can be substituted for another. He can make various combinations of two substitute goods which give him the same level of satisfaction. Thus, he would be indifferent between the combinations when he makes a choice. When such combinations are plotted on a graph, it results in indifference curve. It can also be called as Iso-utility curve.

Indifference Schedule

- For goods X and Y- suppose there are 5 combinations of units of X and Y consumed giving equal utility U. See fig. 1.

Combination	Units of Y	Units of X	Total Utility
a	27	5	U
b	20	11	U
c	12	17	U
d	7	20	U
e	3	25	U

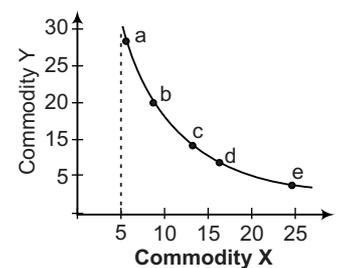


Fig. 1

- All the combinations lying on this curve will give same total utility U.

Indifference Map

Consumer can take many other combinations giving total utility greater than or less than U. So, there can be various indifference curves showing various levels of total utility. In this chart, four IC curves IC_1, IC_2, IC_3, IC_4 make an indifference map. IC_1 having lowest total utility and curve IC_4 represents combinations giving the highest total utility. Least total utility is U_1 and highest total utility is U_4 . See fig. 2 .

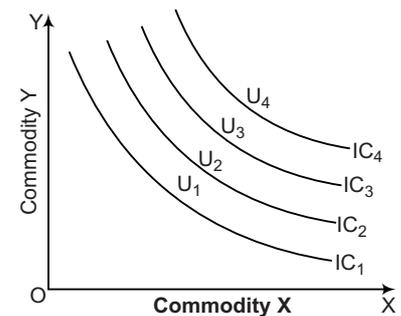
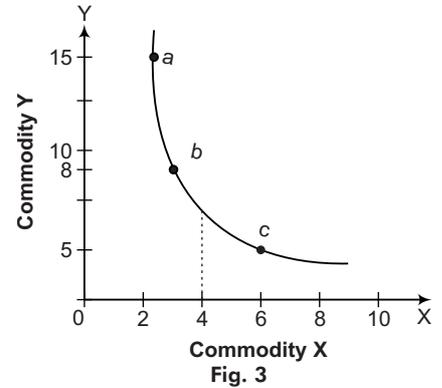


Fig. 2

Properties of Indifference Curve

- Indifference curve have a negative slope-which implies that the two commodities are substitutes for each other. Also if quantity of one commodity is increased, the quantity of other commodity will automatically be decreased so that consumer feels the same level of satisfaction from the new combination of the two commodities. **See fig. 3.**

Combination	Units of Y	Units of X	MRS _{y-x}
a	15	2	
b	8	4	$-7/2 = -3.5$
c	5	6	$-3/2 = -1.5$



- Marginal rate of substitution is negative and goes on decreasing from 3.5 to 1.5. This diminishing marginal rate of substitution causes the indifference curves to be convex to the origin. It also implies that no two commodities are perfect substitutes for one another.
- Indifference curves can neither intersect nor be tangent to one another. The intersection violates the transitivity rule of A=B, B=C, then A should be equal to C (A = C), where A, B and C are three different combinations of two commodities lying on the same IC curve.
- Upper Indifference curve represent a higher level of satisfaction than the lower ones.

Budget Line/Price Line

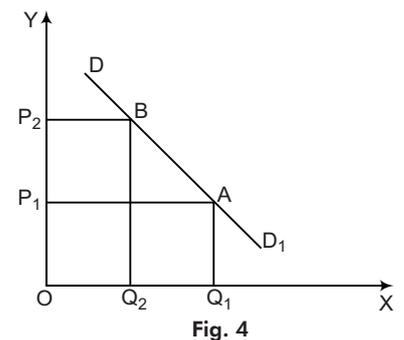
- Every consumer wants to maximize his utility from expenditure incurred on buying goods. But, every consumer has two limitations — one is his limited income, and other is the price of product. These two combined form a budgetary constraint. All the combinations of two commodities available to the consumer, whose, combined price do not exceeds his income, when joined form a budget line, or price line. Slope of budget line is equal to the price ratio of two commodities.
- The demand curve is negatively sloped indicating that a fall in price leads to increase in demand. This is because of the following reasons
 - Lower prices bring in new buyers to add to market demand.
 - Decline in price causes the real income of the consumer to increase which induces more buying capacity. This is called “Income Effect”.
 - When price falls, but prices of other related goods remains constant, commodity becomes relatively cheaper. This makes the consumer to replace costly goods with this cheaper goods. This is called “Substitution Effect”.

Movement Along the Demand Curve

It implies extension or contraction of demand. This is related with changes in the price of commodity, There will not be any change in other factors affecting demand. Suppose on demand curve DD₁, consumer changes his demand from Q₁ at lower price P₁ on Point A to the new demand Q₂ at higher price P₂ on point B, this is upward movement along the demand curve from point A to B due to increase in price.

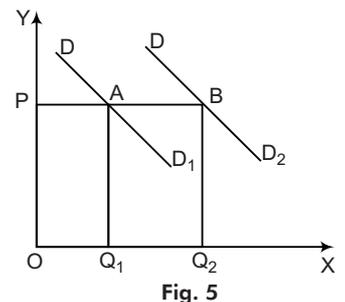
This is called contraction in demand = OQ₁ – OQ₂ = Q₁Q₂

Decrease in price cause increase in demand which is extension of demand. Increased price causes contraction of demand. **See fig. 4.**



Shift in Demand Curve

It implies movement of demand curve from one position to another, not because of changes in the price of commodity, but because of change in other factors like income, tastes, price of related goods. This change is called as in as increase in demand or decrease in demand. Initially quantity demanded is OQ₁ at a price P on A point of demand curve DD₁. Now demand curve shift upward right to new position as DD₂. At same price P, quantity demanded increased to OQ₂. This change is due to non-price factors. **See fig. 5.**



Revealed Preference Theory—By Samuelson

This theory is based on the axiom that all the combination on a budget line are equally expensive, and if a consumer purchases any one particular combination. It means his preference for that particular combination is revealed. The consumer reveals his preference by the combination of goods he buys at different prices. This theory is also treated as the “Third root of the logical theory of demand”.

Demand Function

Demand function sets the relation between the demand and the factors that influence the demand. Demand for a commodity not only depends on the price of a commodity, but also on the income, price of substitutes and complementary goods, tastes, habits of consumer.

Short-run Demand Function

Quantity demanded of X (D_x) depends on prices of X (P_x), other factors remain constant in the short run.

Thus $D_x = f(P_x)$. Thus change in P_x causes change in D_x .

Long-run Demand Function

Quantity demanded of X (D_x) depends on all the factors related to price as well as the consumer.

$$D_x = f(P_x, I, T, P_s, P_c \dots),$$

where, P_x = Price of commodity x

I = Income of consumer,

T = Taste and preference of consumer

P_s = Price of substitute goods,

P_c = Price of complementary goods

Linear Demand Function

It is a straight line curve with constant $\Delta D/\Delta P$ i.e., change in demand *w.r.t* change in price is same on the whole curve. It creates demand line.

Non-linear Demand Function

It is a curvilinear shaped curve with $\Delta D/\Delta P$ changes along the curve. It creates demand curve.

Law of Demand

This law states that demand for goods increases with the decrease in price for goods, other factors remaining same.

Elasticity of Demand

Law of demand tells us the effect of changes in price on the demand in terms of increase or decrease but does not inform about the degree of responsiveness of consumers to a price change. We cannot quantify the change in demand by studying law of demand.

- Elasticity of demand is the measure of the responsiveness of demand to changing prices. The measure is known as the elasticity coefficient (E_d).

$$E_d = \frac{\Delta Q / Q}{\Delta P / P}$$

Types of Demand Curves on Basis of Their Elasticities**Perfectly Inelastic Demand Curve**

- Curve where price change has no effect on quantity demanded. It remains OQ at price OP_1 as well as OP_2 $\Delta Q = 0$. Total revenue decreases with decrease in price.
- $E_d = 0$. Very essential commodities like medicines, salt, etc have no effect on demand of the change in price.

Inelastic Demand Curve

When the price (P) falls, the quantity (Q) increase but at less rate, total revenue (TR) still decreases. **See fig 6.**

$$\Delta Q < \Delta P, E_d < 1$$

It is also called as relatively inelastic demand curve.

$$P_1 = 50, Q_1 = 10, TR_1 = 5000$$

$$P_2 = 10, Q_2 = 130, TR_2 = 1300$$

$$\Delta Q = 30, \Delta P = 40, E_d < 1$$

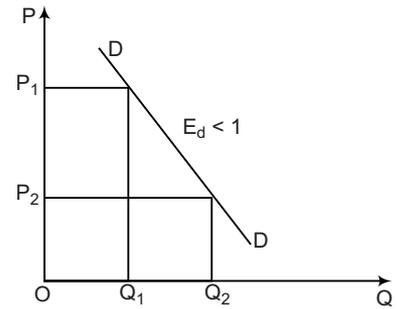


Fig. 6

Unitary Elastic Curve

It is a case where total revenue remains unaffected by change in price. Change in price will have equal affect on change in demand, so that total revenue remains same. **See fig. 7.**

$E_d=1$

$$P_1 = 100, Q_1 = 5, P_1Q_1 = TR_1= 500$$

$$P_2 = 10, Q_2 = 50, P_2Q_2 = TR_2= 500$$

$$E_d = \frac{\Delta Q / Q}{\Delta P / P} = \frac{45 / 5}{90 / 10} = 1$$

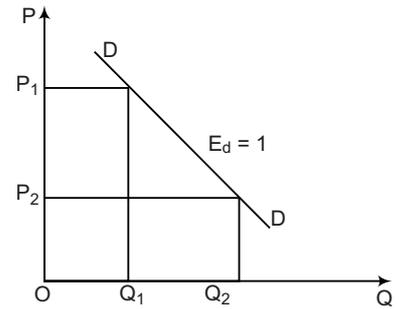


Fig. 7

Elastic Demand Curve

It has an elasticity coefficient between 1 and ∞ , have the property that when price decreases, revenue increases and *vice versa*. **See fig. 8.**

Quantity demanded increases at much greater rate than price decrease.

$$P_1 = 10, Q_1 = 50, TR_1= 500$$

$$P_2 = 5, Q_2 = 150, TR_2= 750$$

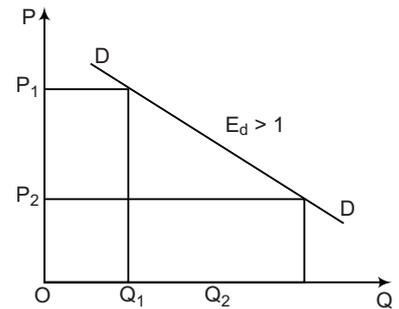


Fig. 8

Perfectly Elastic Demand Curve

These are the curves where quantity demanded is infinitely responsive to a very small price change. **See fig. 9.**

When price falls, demand increases infinitely, $\Delta Q \rightarrow \infty, \Delta P \rightarrow 0, TR \rightarrow \infty$

When price rises, quantity demanded falls to zero and total revenue falls to zero

$$\Delta Q \Rightarrow 0, TR = 0$$

This is a situation where no reduction in price is needed to cause an increase in demand to infinity.

$$E_d = \infty$$

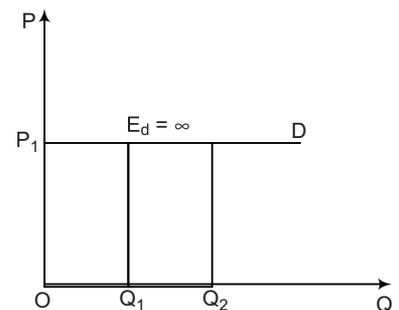


Fig. 9

Measurement of Elasticity of Demand—By Marshall

- The elasticity can be measured between any two points on a demand curve called arc elasticity or at a point called as point elasticity.
- Method for arc elasticity $e_p = - \frac{\Delta Q}{\Delta P} \cdot \frac{P_1}{Q_1}$
- Point elasticity method is used where change in price is infinitesimally small. It is equal to ratio of lower portion below point to the upper portion above point on the linear curve.

$$e_p = \frac{\partial Q}{Q} \cdot \frac{P}{\partial P}$$

Relation Between Price Elasticity (e_p) and Marginal Revenue (MR)

Total revenue $TR = P \cdot Q$

Marginal revenue $MR = \frac{\partial TR}{\partial Q} = \frac{\partial (P \cdot Q)}{\partial Q}$

$$\Rightarrow MR = \frac{P(\partial Q)}{(\partial Q)} + \frac{Q \cdot (\partial P)}{(\partial Q)} = P + \frac{Q \cdot (\partial P)}{(\partial Q)}$$

$$\Rightarrow MR = P \left[1 + \frac{Q}{P} \cdot \frac{(\partial P)}{(\partial Q)} \right] = P \left[1 + \left(\frac{-1}{e_p} \right) \right]$$

$$\Rightarrow MR = P \left[1 - \frac{1}{e_p} \right]$$

Relation Between Price Elasticity (e_p) and Average Revenue (AR)

Price = Average revenue (AR), $P = AR$

$$MR = AR \left[1 - \frac{1}{e_p} \right] = AR - \frac{AR}{e_p} \Rightarrow e_p = \frac{AR}{AR - MR}$$

Price Elasticity of Demand

A product with more elastic demand will be fixed at a lower price relative to the product having inelastic demand whose price can be fixed high. See fig. 10.

$$E_p = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

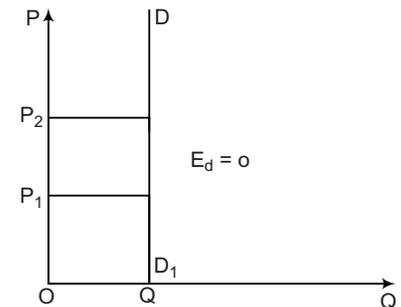


Fig. 10

Income Elasticity of Demand

$$E_y = \frac{\Delta Q}{\Delta Y} \cdot \frac{Y}{Q}$$

Where, ΔY = change in income. Income elasticity of demand is low for inferior goods as with increase in income, consumer will buy less of these goods, and high for superior goods.

Cross Elasticity of Demand

The cross elasticity (E_c) is the measure of change in demand for a commodity in response to the changes in the price of its substitute goods or complementary goods.

$$E_c = \frac{\Delta Q_1}{Q_1} \cdot \frac{P_2}{\Delta P_2}$$

Where Q_1 is quantity demand of product 1 and P_2 is price of product 2.

Complementary Goods

- Electricity and electrical machines, butter and bread, pen and ink, petrol and vehicle. Substitute goods can be vanaspati ghee and desi ghee, tea and coffee, sugar and jaggery, vegetables and pulses.
- The cross elasticity of demand of complementary goods is negative, two goods A & B are complementary to each other, fall in price of A will lead to increase in demand for B and *vice-versa*.
- The cross elasticity of demand for substitute goods is positive. The fall in price of coffee will decrease the demand for tea and *vice-versa*.
- Cross elasticity defines the relationship between two commodities. If E_C is positive and higher the two goods are very close substitute. If E_C is lower in value and negative, the two goods are complementary to each other, but to some extent only.

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- Cross elasticity for two goods cannot be reciprocated. The E_C of tea w.r.t coffee is never equal to the E_C of coffee w.r.t tea.

Advertising Elasticity of Sales

- The responsiveness of sales to the changes in promotional expenditure can be measured in terms of advertising elasticity of sales, E_A

$$E_A = \frac{\Delta S / S}{\Delta A / A}$$

- Suppose $E_A = 0.4$. It means that the one per cent increase in ad-expenditure results in only 0.4 per cent increase in sales(s).
- Advertising elasticity (A) lies between zero and infinity. It can never be negative.

Factors That Determine Ad-elasticity are

- The level of total sales.
- Advertisement by competitive firms.
- Overall effect of past advertisement.
- Other factors like product's price, consumer's income, etc.

Elasticity of Price Expectation

- This concept was introduced by JR Hicks in 1939. Sometimes, consumer decides to buy a good in anticipation of fluctuations in future price.
- The price-expectation-elasticity (E_x), refers to the expected changes in future price, (P_f), as result of change in current prices, (P_c), of a good.

$$E_x = \frac{\Delta P_f / P_f}{\Delta P_c / P_c}$$

- Concept of elasticity of price-expectation is very useful in formulating future pricing policy. It is important in case of costly and highly valuable goods.

Demand Forecasting

As defined by 'Cundiff and Still', "Demand forecasting is an estimate of demand during a specified future period based on a proposed marketing plan and particular uncontrollable and competitive forces."

Methods of Demand Forecasting

- There are two categories in which demand forecasting methods were classified—survey method and statistical methods.
- Survey method can be applied to consumer using census or sampling and can also be applied to opinion poll from experts using Delphi method.
- Statistical methods can be trend projection methods (least square and graphical methods), barometric methods and econometric methods (Regression method and simultaneous equations method).
- Least square method is used for projecting trend line. When the time series data shows a increasing trend in the sales, then a linear trend equation $s = a + bt$ can be used, a and b are constants, t is time period, and s is sales in a year.
- Barometric method is based on the work done by National Bureau of Economic Research of US. It is used to forecast general trend in overall economic activities or general business conditions of an industry. Economic indicators used are
 - **Leading indicators** variables which move up and down ahead of other related variables
 - **Coincidental indicators** variables that move up and down simultaneously with economic activity or market trends.
 - **Lagging indicators** variables which fall behind other variables.

- Barometric method can only be used for forecasting very short run demand. It is generally used to forecast business cycles.
- Delphi method attempts to arrive at a consensus between all experts about the future demand of a product by repeatedly questioning these experts. Information about opinions of other experts is shared between all experts. This feedback helps the expert in revising their earlier opinions. This may result in narrowing down of different views.

Production Function

It is the technological relationship between all the inputs and outputs which can be represented in the form of an equation. The production function may take the form of a schedule, a table, a graph or curve, or a mathematical equation.

$$Q = f(L, K, M, T, t, LB)$$

Where, Q = Quantity of output
 T = Technology
 L = Labour
 M = Material
 LB = Land and building
 t = Time
 K = Capital

Short-run Period

It refers to a period of time in which the supply of certain inputs, like plant and building, is fixed or is inelastic. Thus, production can be increased by increasing use of variable inputs like man power and raw material.

Short-run Production Function

Supply of capital (K) is inelastic or fixed. It is also called single variable input production function.

$$Q = f(K, L)$$

Long-run Period

A period of time in which the supply of all inputs is elastic, but cannot change the technology. All inputs are variable.

Long-term Production Function

Both K & L can be increased $Q = f(K, L)$

Very Long-run Period

Refers to a period of time in which the technology of production is also subject to change or can be improved along with other inputs.

Cobb-Douglas Production Function

- Paul H Douglas and CW Cobb introduced this functions, it is a linear, homogeneous production function of the first degree which takes into account only two inputs—
- Labour and capital for the entire output of manufacturing industry.
- If inputs K and L are increased by 'N' times, output Q will become NQ *i.e.*, increased N times.
- In the Cobb-Douglas function, the sum of exponents ($a + b$) shows the degree of return to scale.
 $a + b = 1$ shows constant returns to scale (Case of Cobb Douglas)
 $a + b > 1$ shows increasing returns to scale
 $a + b < 1$ shows decreasing returns to scale.

$$Q = AK^aL^b, a + b = 1$$

where, a & b are constant. $a = \frac{1}{4}, b = \frac{3}{4}$

Nature of Production Function

- The factors of production are complementary to one another, this is revealed by principle of “returns to scale” where all the inputs are required to be increased simultaneously to attain higher scale of total output.
- The factors of production are substitutes of one another. We can substitute one unit of capital by few units of labour.
- All inputs are specific to the production of a particular product, none of the factors can be ignored.

Laws of Returns to a Variable Input

This law states that when more and more units of a variable input (labour) are used with a given quantity of fixed input (capital), the total output may initially increase at an increasing rate, then at a constant rate but finally it increases at “Diminishing” rate. Thus, marginal increase in total output decreases when more and more units of a variable factor are used, given the state of technology and fixed factors.

Assumptions of Law of Diminishing Returns

- Labour is the only variable input.
- All other factors remain same.
- Labour is homogeneous.
- State of technology is fixed.
- Input prices are given.
- In the words of Prof Samuelson, an increase in some inputs, will, in a given state of technology, cause output to increase but after a point the extra inputs will become less and less effective.”
- These extra inputs are surplus labour whose marginal productivity eventually declines.
- **Total Product (TP)** increases initially at an increasing rate till the marginal product is also increasing, it is first stage (increasing returns). Once the marginal product declines, the total product starts increasing at a decreasing rate. This is the stage of diminishing returns (second stage).
- When **Marginal Product (MP)** becomes zero, total product is at maximum level. After word, MP becomes negative, TP started declining. This is the (third stage) stage of negative returns.
- When $MP = AP$, Average Product is at its maximum.
When $MP = 0$, TP is at its maximum.
When $MP < AP$, AP starts declining.
- Point of inflexion is the level at which MP is maximum. Till the point of inflexion, TP curve increases sharply.

Iso-Quant Curve

It can be defined as the locus of all those points representing various combinations of two inputs—capital and labour yielding the same level of output. It is also called as “Equal Product Curve” or “Production Indifference Curve”. When both these inputs can be changed in long run, relationship between inputs and outputs can be explained by laws of returns to scale”.

Assumptions of Iso-quant Curves

- There are only two inputs labour and capital.
- Both inputs are perfectly divisible.
- Both are imperfect substitutes for each other.
- Technology of production is constant.

Iso-quant IQ_1 See fig. 11 represent various input combinations producing 50 units of output

Points	K	L	Output
A	60	10	50
B	40	15	50
C	20	20	50

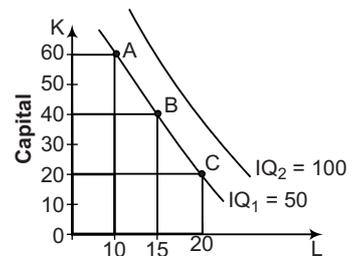


Fig. 11

20 units of capital are being substituted by **5 units** of labour when we go from point A to B.

Properties of Isoquants

- Isoquants have a negative slope-this shows diminishing rate of substitution between two inputs curve moves downward to the right. **See fig. 12.**
- Isoquants are convex to the origin-shows diminishing **Marginal rate of technical substitution (MRTS)**

$$MRTS = \Delta K/\Delta L = \text{slope of IQ}$$
- Isoquants are non-intersecting and non-tangential to one another. If it happens, say IQ_1 and IQ_2 intersect at point C. This shows a combination of K and L at point C which yields two level of output, 20 units and 40 units which cannot be possible with a given technology.
- Upper isoquants represent higher level of output.

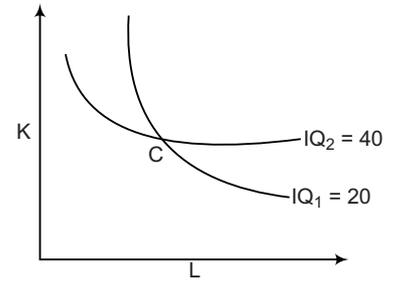


Fig. 12

Economic Region on Isoquants Map

It is that area of production plan in which substitution between two inputs is technically feasible without affecting the output see fig. 13. This area is marked by locating the points on all the isoquants at which $MRTS=0$. This can be obtained by drawing upper ridge line (locus of points on isoquants where Marginal Product (MP) of capital is zero) and lower ridge line (all points on isoquant where MP of labour is zero). Any production technique *i.e.*, capital - labour combination requires minimum combination of inputs in this region. **See fig. 13.**

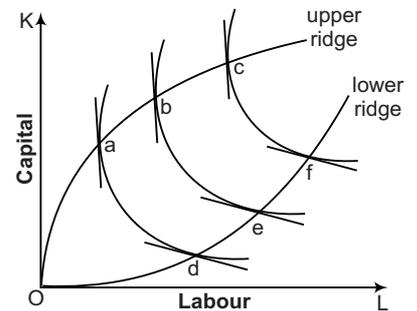


Fig. 13

Types of Isoquants

Depending upon degree of substitutability of factors.

Linear Isoquant

It implies perfect substitutability between capital (K) and labour (L) in production. Isoquant AB represents that a given output can be obtained by using only capital (at point A) or only labour (at point B) or by using both K and L (all points on AB curve). It also implies that $MRTS$ between K and L remains constant throughout. **See fig. 14.**

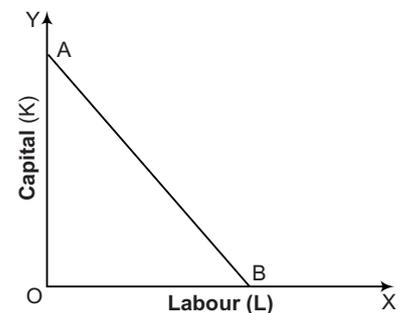


Fig. 14

Leontief Isoquant/L-shaped Isoquant

- When a production of a certain quantity can be produced using a fixed proportion of both K and L the isoquant takes L shape.
- This assumes a perfect complementarity between K and L *i.e.*, only one combination of K and L can produce one level of output.
- There is zero substitutability between K and L. It also implies that quantity of one input is changed and the quantity of other input is held constant, there will be no change in output **See fig. 15.** Change in output can be possible only by change in quantity of both input. It is also called input-output isoquant. It assumes only one technique of production to produce Q_1 output, K_1, L_1 (A) is required. Even if K_1 is increased to K_2 , new combination K_2, L_1 (B) or K_1, L_2 (C) give same output Q_1 . To produce Q_2 output, new combination K_2, L_2 is required.

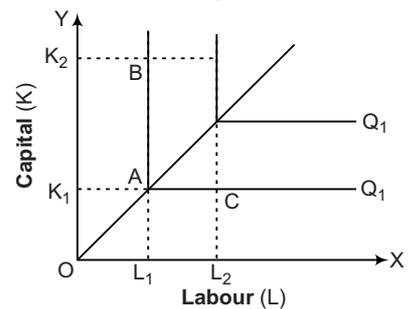


Fig. 15

Kinked Isoquant/Linear Programming Isoquant

- It assumes that there are only a few process/techniques/combinations of two inputs that can produce a particular quantity of output. This assumes limited substitutability of K and L. But this substitutability is possible only at the kinks. OA, OB, OC, OD represent various techniques or processes. **See fig. 16.**

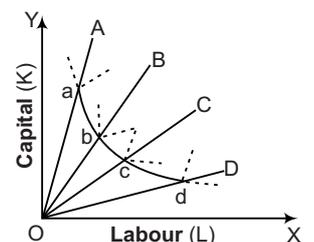


Fig. 16

Managerial Economics

- By joining kink points *a, b, c, d*, we get Kinked isoquant. It is also called the “**linear-programming isoquant**” or “**activity analysis isoquant**”.
- Kink are the technical feasible points.
But on normal isoquant curve, all points are technically feasible for production.

Smooth, Convex Isoquant

- This form assumes continuous substitutability of capital (K) and labour (L) only over a certain range, beyond which factors cannot substitute each other. The Isoquants appears smooth and convex to origin. See fig. 17.

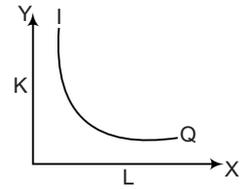


Fig. 17

Isocost Line/Price Line/Outlay Line

- It indicates different combinations of two factors of production which a firm can purchase at given prices with a given cost.
- As the cost of factors increases, Isocost line moves right upward. A producer is in the state of equilibrium at point *Q* at which Isocost line *AB* touches isoproduct curve *IP*. Point *Q* is the optimum factor combination which produces output at minimum cost also known as **Least Cost Combination (LCC)**. See fig. 18.

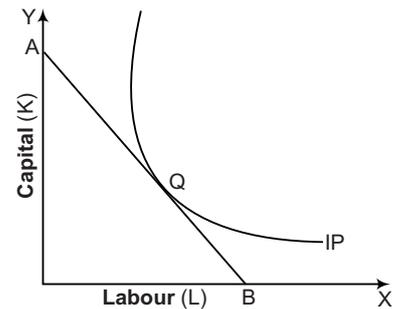


Fig. 18

Production Possibility Curve (PPC)

- Producer has limited factors of production and they can be put to various uses for producing various commodities. So, these factors or inputs can be used in a way to produce various combinations of goods. These combinations of two commodities are termed as **Production Possibilities (PP)** and the curve joining these PPs is known as **Production Possibility Curve (PPC)**. Thus, we can explain using chart.

PPs	Production of TV	Production of Fridge
A	0	30
B	10	25
C	15	20
D	25	10
E	30	0

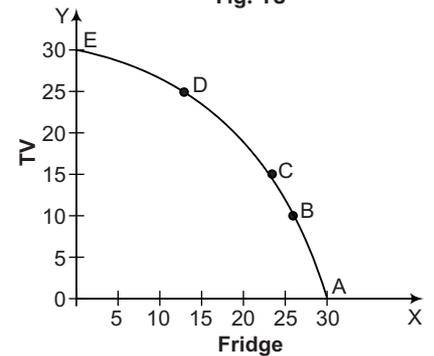


Fig. 19

Four PPs are shown of PPC curve *AE*. See fig. 19.

- Production possibility curve slopes downwards to the right and is concave to the origin. It implies that for production of additional units of goods on X-axis, increasing quantities of goods on Y-axis will need to be sacrificed. It is assumed that the time period is short and production technique is constant.

First Order Condition for Least Cost Combination (LCC)

Can be expressed as : Ratio of Marginal Productivity (MP) of two factors should always be equal to the ratio of prices (P) of these two factors of production

L = labour, K = capital $\frac{MP_L}{MP_K} = \frac{P_e}{P_k}$

Second Order Condition for LCC

Also called as **supplementary condition**. It requires that the first order condition be fulfilled at the highest possible isoquant.

Laws of Returns to Scale

It explains the behaviour of output in response to proportional and simultaneous change in all the inputs. This can be possible in long-run when production capacity can be increased beyond its maximum limit by increasing fixed as well as variable factors of production. This is an expansion of scale of production.

Increasing Returns to Scale

When output increases more than proportionately to the increase in inputs. Suppose if on doubling the inputs, output increases more than double, it exhibits increasing returns to scale. Marginal product is always greater than the average product. $MP > AP$

Causes for Increasing Returns to Scale

- Indivisibility of factors of production like machines and managers. If scale is increased, capabilities of a manager as well as the machine can be fully utilized. This is application of managerial economies.
- Higher degree of specialization increases productivity of both labour and machinery.
- Financial economies of buying in bulk reduces the transportation cost as well as purchase prices can be negotiated when volume is large.

Constant Returns to Scale

When output increases in the same proportion to the increase in inputs, it exhibits constant returns to scale. Average product and marginal product will not change and will remain same at all levels of production $MP = AP$. The constant returns are the result of limits of economies of scale. Once the factors of production reached its optimum level, production cannot be increased beyond this limit, it will stagnate. This production function is homogeneous of degree 1, capital-labour ratio is fixed.

Decreasing Returns to Scale

It applies when a certain proportionate increase in inputs leads to a less than proportionate increase in output. This can be explained as when capital and labour are increased by 50% the output increases by only 40%. In this case marginal product is always less than average Product $MP < AP$. It implies total product is increasing at diminishing rate.

$MP = 0$, when TP is maximum.

Types of Costs

Explicit Cost

Are the money expenditure incurred on the resources used in the production of a commodity. These are also known as paid out costs, expenditure costs and also as outlay costs.

Implicit Cost

- Are the costs of self-owned and self-employed resources, which if employed else-where were being paid. These include interest on capital employed by entrepreneur in his firm, rent of building owned by entrepreneur, reward for his managerial skills. These are non-expenditure costs also called as imputed cost. Opportunity cost is an example of imputed cost.
- The explicit and implicit costs together make the economic cost.

Social Cost

These are the costs that arise due to the production of the firm but they are not borne by the firm but they are borne by the society. This cost includes (i) the use of natural resources freely available, and (ii) the dis-utility created in the process of production. These cost together constitute social cost, also termed as external costs. *Example* is the chemical factories discharging its waste in rivers, air pollution created by chimneys of the firm, etc. Resources used are atmosphere, rivers, land etc.

Real Cost

Efforts, pains and exertions of labour along with wait and abstinence required by entrepreneur for saving the capital used in making a commodity. It is a subjective type of cost introduced by **Marshall**.

Incremental Cost

Increase in total cost on an increase in the level of operations is called the incremental cost. This cost is associated with the decisions to expand the output or to add a new variety of product or to replace worn out plant and machinery. It is also termed as **differential cost** and it does not apply to a new firm but applies to existing firm only.

Fixed Cost (FC)

Are costs incurred on production firm which is fixed in short-run irrespective of the volume of output level. These are incurred even if production comes to halt. These include office over heads, depreciation on machinery, building, maintenance of firm etc. Fixed costs are also known as general costs, supplementary costs and indirect costs.

Variable Cost (VC)

Also known as prime costs or direct cost, it varies with the variation in the volume of total output. It includes cost of raw material, running cost of fixed capital, direct labour charges and costs of all other inputs that vary with output.

Total Cost (TC)

It is the sum of fixed costs and variable cost. $TC = FC + VC$

Total cost curve TC moves parallel to total variable cost curve (TVC)

because difference between TC and TVC is FC which remains constant. **See fig. 20.**

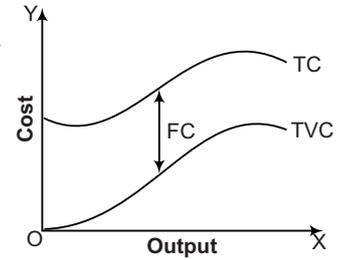


Fig. 20

Average Variable Cost (AVC)

AVC declines at initial stage due to law of increasing returns. It becomes constant when firm attains its full capacity, AVC starts to increase due to application of law of diminishing returns. Thus, AVC gets 'U' Shape in long-run. Same is applicable to Average Cost Curve. It is also U shaped. **See fig. 21.**

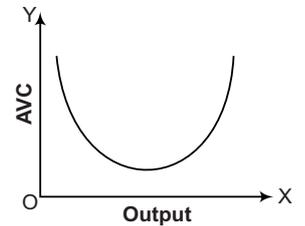


Fig. 21

Types of Cost Functions

Short-run Cost Functions

The shape of the short run cost curves depends on the type of cost functions like linear, quadratic or cubic functions.

Linear Cost Function

$$TC = a + bQ$$

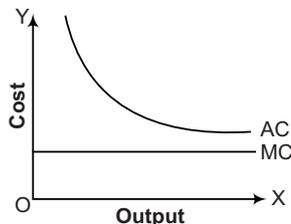
$$a = TFC, b = \text{change in TVC} = MC,$$

Q = quantity produced

$$MC = \frac{\partial TC}{\partial Q} = b.$$

MC remains constant throughout in case of a linear function. **see fig. 22.**

Average cost and marginal cost curves can be presented as.



Average cost continues to decline with the increase in output.

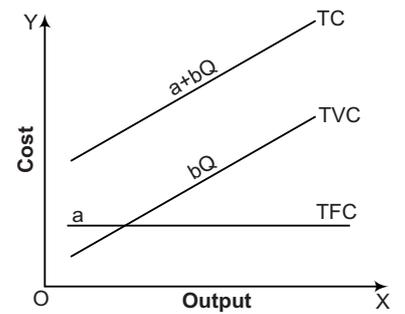


Fig. 22

Quadratic Cost Function

$$TC = a + bQ + Q^2, AC = \frac{a}{Q} + b + Q, MC = b + 2Q$$

where a, b are constants, Q is total output, TC is total cost.

Cubic Cost Function

$$TC = a + bQ + CQ^2 + Q^3, AC = \frac{TC}{Q} = \frac{a}{Q} + b + CQ + Q^2$$

where, a, b and C are constants

$$MC = \frac{\partial TC}{\partial Q} = b + 2CQ + 3Q^2$$

Relation between MC and AC Curve

- Both AC and MC are derived from total cost. So as far as AC falls, MC falls more sharply $MC < AC$.
- MC curve cuts AC curve from below at the minimum. This is point of optimum capacity.
- When AC increases, MC also increases but at a more pace, *i.e.*, $MC > AC$ after intersection. **See fig. 23.**
- MC reaches its minimum level sooner than AC.
- Thus, just before the point of intersection, MC must be rising while AC is falling but MC curve must be below the AC curve.

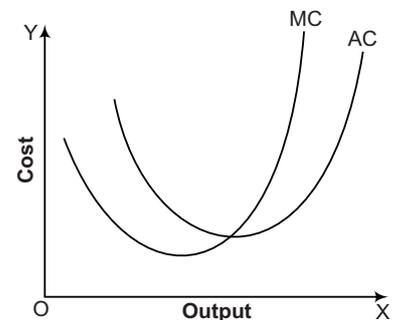


Fig. 23

Long-run Cost Curve

Long-run is a period characterised by changing factors of production, fixed as well as variable.

The firm plans to produce more by building a new large plant by changing the production technique. **See fig. 24.** Laws of return to scale applies

- Each plant capacity has its own **Short-run Average Cost Curve (SAC)**. In long-run, there can be a large number of plants as well as their SACs.
- LAC curve is a U shaped curve enveloping all the SACs. LAC curve is flatter, smooth and is tangential to all the SAC at its minimum point. It is also called envelope curve.
- Long-run Average Cost Curve (LAC)** helps the firm to determine an optimum scale of operation which incurs least cost and maximum profit.

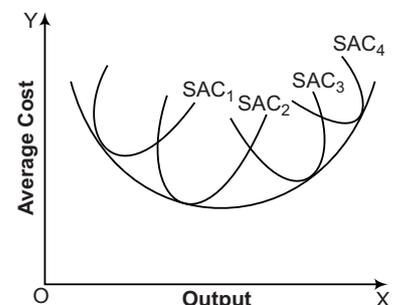


Fig. 24

Characteristics of LAC Curve

- LAC curve can never intersect or cut a SAC curve though they are tangential to each other. This implies that for any given output, average cost cannot be higher in the long-run than that in the short-run.
- If law of constant return applies to industry, LAC curve can be a horizontal line. In this case, point of minimum cost of all SACs will be equal.
- LAC is always lower than SACs because costs can be reduced only in the long run.

Break-even Analysis

For any firm to operate, there is a level of output, below which production is non-profitable or may be in loss, and above which the firm starts earning profit. Break-even analysis helps the firm in determining this break even point at which firm is at par *i.e.*, revenues are equal to costs and no-loss no-profit situation has arrived.

Break-even analysis, also known as Cost-Volume-Profit analysis is a technique to study the relationship between the total costs, total revenue and total profits or losses over various levels of output.

At break-even point $TR = TC$

Relation between Break-even Volume and Price

$$TR = TC = TFC + TVC$$

$$TVC = AVC \times Q_b$$

$$TR = P \times Q_b \Rightarrow P \times Q_b = TFC + AVC \times Q_b$$

$$Q_b (P - AVC) = TFC$$

$$Q_b = \frac{TFC}{P - AVC} = \frac{TFC}{P - MC}$$

Where, TFC = Total Fixed Cost, P = Unit Price, AVC= Average Variable Cost = MC
 Q_b = Break Even Volume.

Break-even Chart

At point B, TR curve and TC curve intersect. At OM level of output, total cost equals total revenue. Thus, B is the break even point. Below point B, TC curve is above TR curve showing losses. Above B, TR curve is higher than TC curve implying profits. See fig. 25.

Assumptions of Break-even Analysis

- All costs can be separated into fixed and variable costs.
- Selling price will remain same throughout the operation though there may be competition or change in volume of production.
- There will not be any opening or closing stock .
- There will not be any change in technology of production.

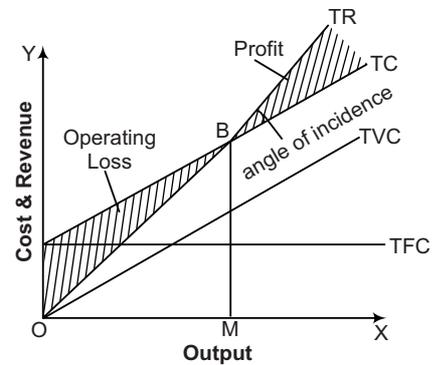


Fig. 25

Relation Between Break-even Point and P/V Ratio

$$\text{Break even point (in sales)} = \frac{\text{Fixed Cost} \times \text{Selling Price}}{\text{Selling Price} - \text{Variable Cost}} = \frac{F \times SP}{SP - V}$$

$$P/V \text{ Ratio} = \frac{SP - VC}{SP}$$

$$\text{BEP (in sales)} = \frac{\text{Fixed cost}}{P / V \text{ Ratio}}$$

Margin of Safety (MoS)

It is the difference between actual sales and the break even point sales. It is the range of sales over and above the break even sales. If the difference is big, it implies that the firm can still make profits even after a serious drop in production

$$\text{MoS} = \text{Present sales} - \text{Breakeven sales} = \frac{\text{Profit}}{P / V \text{ ratio}} = (\text{Profit}) / \left(\frac{\text{Contribution}}{\text{Sales}} \right)$$

Unsatisfactory margin of safety can be improved by increasing the level of production, increasing the selling price, reduces the total cost of production and by substituting the current products by more profitable products which can be produced by the firm.

Market Structures

The number of sellers of a product in a market determines the type of market and degree of competition in the market.

Depending on the number of sellers, market structure is divided into **four categories**

- Cat. 1-Perfect competition
- Cat. 2-Oligopoly
- Cat. 3-Monopolistic competition
- Cat. 4-Monopoly

Perfect Competition

According to **Prof Ferguson**, “Perfect competition describes a market in which there is complete absence of direct competition among economic groups.”

Perfect competition is characterised by the presence of large number of firms selling homogeneous products with no product difference like farm production and financial market products.

Features of Perfect Competition

- Great number of buyers and sellers, no one is capable of affecting the price in the market.
- Free entry and free exit for all buyers and sellers in the perfect competition market.
- Homogeneous products are identical and perfect substitute.
- All buyers and sellers have perfect knowledge of prices.
- All firms enjoy easy access to the market. There is absence of any transport cost which differentiates the price.
- Absence of government or artificial restrictions on the working of the firms.
- **Pure competition** It is the perfect competition with no perfect mobility of factors and with no perfect knowledge.

Pricing Under Perfect Competition

Price is determined by the laws of supply and demand. Price will be fixed at a point where the market demand and market supply are at an equilibrium. Demand is governed by the law of demand based on marginal utility of the commodity to the buyers. Supply is governed by the cost of production. Point at which the market demand equals to the market supply, that is the point of equilibrium. **See fig. 26.**

DD' is the market demand curve and SS' is the market supply. Both curves intersect at point E. PE is the equilibrium price of the industry.

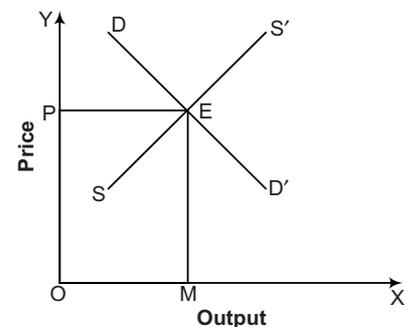


Fig. 26

Price Elasticity of Demand for an Individual Firm in a Perfect Competition

It is infinite. Demand curve will be a horizontal straight line at the particular price level as firm can sell infinite quantity of product at prevailing price in the market. There is no degree of control over the price by any single firm. **See fig. 27.**

In perfect competition, $MR = AR = MC = P$

firm makes normal profit. If $AR > AC$, then only firm makes economic profit.

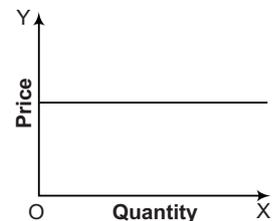


Fig. 27

Pure Monopoly

It means an absolute power of a firm to produce and sell a product that has no close substitute in the market. The cross elasticity of demand for a monopoly product is either zero or negative. Firm and industry are identical in a monopoly competition.

1. A natural monopoly may emerge out of the technical conditions of efficiency and economies of scale.
2. There is no certainty that a monopoly firm will always earn an economic profit. This all depends on
 - its cost and revenue conditions.
 - threat from potential competitors.
 - government policy in respect of monopoly.

Profit of Monopoly Firms

If $AR > AC$, firm enjoys supernormal or economic profit.

$AR = AC$, firm enjoys normal profit.

$AR < AC$, firm makes losses.

Measure of Monopoly Power

JS Bains and AP Lerner have used “Excess Profit” criterion for calculating the monopoly power of a firm. Excess profit can be defined as the profit in excess of the opportunity cost. While calculating excess profit, the opportunity cost of owner's capital and a margin for the risk must be deducted from the actual profit made by the firm.

Managerial Economics

(i) JS Bains formula

$$\text{Monopoly power} = \frac{R - O}{R}$$

where, R = actual profit O = opportunity cost

If $(R - O) / R = 0$, there exists no monopoly, and if this ratio is greater than zero, there is monopoly. The higher value of $(R - O) / R$, the greater is the degree of monopoly.

(ii) AP Lerner formula

$$\text{Monopoly power} = \frac{P - MC}{P}$$

where,

P = Price, MC = Marginal Cost

For a profit maximizing firm, MC = MR, P = AR

$$\text{Monopoly power} = \frac{P - MR}{P} = \frac{1}{e}$$

Lower the elasticity, greater the degree of monopoly. Even if $AR = AC$ and firm earns only normal profit, monopoly power still exists.

Monopolistic Competition

It is a market setting in which many firms sell differentiated products. Differentiation is made by way of different brand names, trade marks, designs, colours, shapes, packaging, qualities, etc.

But, still each product is a close substitute for the rival products. Each firm enjoys a quasi-monopoly over its product. Examples are movie theaters, FMCG products, dresses, restaurants, consumer durables. This is perceived difference in the minds of customers.

Price Determination in Monopolistic Competition

- Edward H Chamberlin developed a model for determining equilibrium price. Chamberlin's analysis shows that price competition results in the loss of monopoly profits. All the firms will be looser and no one can gain. He finds out two ways to non-price competition—
(i) Product innovation (ii) Advertisement
- **In monopolistic competition** selling cost includes cost on research and development, free sampling, trade discounts to dealers, free scheme for customers, media ads. Sales increases initially at increasing rates but eventually it decreases. Thus, average selling cost curve initially decreases but ultimately it increases. Therefore, the Average Selling Cost curve is U shaped similar to AC curve.
- Non-price competition through these selling cost leads all the firms to an almost similar equilibrium which Chamberlin calls it as “**Group-Equilibrium**”.
- Price elasticity of demand in monopolistic market is large.
- Two conditions for the firm's equilibrium under perfect competition are $MC = MR = \text{Price}$,
slope of MC curve > slope of MR curve
- The firm will continue to produce only if it covers its variable costs. The point at which the firm covers its variable cost only is called “**closing-down point**”. If sale is below this output level, firm will incur losses.

Oligopoly

This competition is characterised by few firms or sellers selling homogeneous or little differentiated products. The number of sellers is so small that the market share of each firm is large enough for a single firm to influence the market price. Examples are- mineral water, cigarettes, aluminum, steel, cement industry.

Barriers to Enter Oligopolistic Market

- Huge investment requirements to match the production capacity of existing firms.
- Strong customer loyalty.
- Preventing entry of new firms by price war. Mostly MNCs and big corporate houses can enter oligopolistic market.

Augustin Cournot Model

He was the first economist to develop a formal oligopoly model in the form of a duopoly model with two firms dealing in mineral water business.

This model assumes duopoly of two firms operating at zero cost, both of them are facing a demand curve with a constant negative slope. According to this model, profit is maximum when $MC = MR = 0$ and profit maximizing output is half of the total market demand *i.e.*, $Q/2$.

Types of Oligopolies

Partial oligopoly It refers to that market situation where the industry is dominated by one large firm which is looked upon as the price leader. Rest firm decides their price on the basis of this leader.

Full oligopoly It is that market situation where there is no price leadership.

Perfect/ Pure oligopoly If the firms are producing homogeneous products. *e.g.*, aluminium industry.

Imperfect/differentiated oligopoly When competing firms produce imperfect close substitutes which are somehow differentiated. *Example* mineral water industry.

Syndicated oligopoly Situation where the firms sell their products through a centralised syndicate. This syndicate fixed prices and output quotas for all firms.

Collusive oligopoly Refers to that market situation where the firms, instead of competing, combine together to fix price. This body is termed as a cartel.

Non-collusive oligopoly Lack of agreement among the firms.

Economic Impacts of Oligopoly Markets

- High selling cost due to aggressive sales promotion efforts as in the case of Pepsi and Coke.
- Economies of scale cannot be achieved leading to higher costs.
- Price is higher than average cost and marginal cost.

Kinked Demand Curve

- This model of oligopoly was developed by Paul M Sweezy and by Hall and Hitch in the same year 1939. The analysis of kinked demand curve bring out one fact about oligopoly market. **See fig. 28.**
- Price and output once determined tends to remain same even if there is a considerable change in the cost of production. It does not deal with price and output determination.
- Logic behind sticky price of a firm is that **Sweezy** believes if a firm reduces the price, rivals would follow price cuts and neutralise expected benefits from price cut. In case it raises price, other firms may maintain their price or may even reduce it. In this case price rising firm loses its market share. In both cases, price changing firm loses. Thus, it tends to stick to one price.
- The demand curve facing an oligopolist (in case of differentiated products) has a 'kink' at the level of prevailing price. This kink is formed because the segment of demand curve dK above prevailing price level KM is highly elastic and the segment of demand curve below prevailing price level is inelastic. A kinked demand curve dD with a kink at point K has been shown. The prevailing price level is KM and the firm is producing and selling output OM . This difference in elasticities between dK curve and KD curve is due to the particular competitive reaction pattern assumed by kink hypothesis. This hypothesis assumes that when a firm raises its price, all customers would not leave because some customers are intimately attached to it due to product differentiation. Thus, demand curve will not be perfectly elastic.

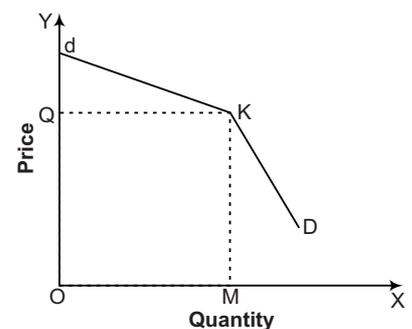


Fig. 28

Monopsony

It is also termed as buyer's monopoly. Monopsony refers to a market situation when there is a single buyer of a commodity or service. The monopsonist can influence the supply price of his purchases by the amount he buys. The monopsonist regulates his purchases in such a way that $MC = MU$ whereby his consumer's surplus is the maximum.

Bilateral Monopoly

It refers to a market situation in which a single producer or seller (monopolist) faces a single buyer (monopsonist). Equilibrium price can be determined by non-economic factors such as bargaining power, negotiation skills, etc.

Price Discrimination

Refers to the practice of a seller of selling the same goods at different prices to different markets. This variation in prices does not reflect variation in costs in two markets. It is practiced in order to maximise profit.

Necessary conditions for Price Discrimination

- Different markets must be separable for a seller to be able to practice discriminatory pricing. Separation can be on the basis of geographical distance involving high cost of transportation, exclusive use of the goods.
- Elasticity of demand for the product must be different in different markets.
- There should be imperfect competition in the market in the form of monopoly.
- Profit maximizing output must be much larger than the quantity demanded by any one market.

Degrees of Price Discrimination

Prof AC Pigou has proposed three degrees of price discrimination on the basis of the extent to which a seller can extract consumers's surplus of the consumers.

First Degree Price Discrimination

It is also termed as perfect price discrimination. It is possible when the market size is small and monopolist knows the highest paying capacity of his buyers. Monopolist sets the price at highest level to extract entire consumer's surplus. Then, he lowers down the price of further units to extract consumer's surplus till last unit consumed. This can be done through auction sale.

Second Degree Block Pricing

Block pricing or second degree price discrimination is feasible where market size is very large. Monopolist divides the whole market into three blocks—higher income group, middle-income group and lower income group. He intends to siphon off only the major part of the consumer's surplus. A single rate is applicable to a large number of buyers within a block.

Third Degree Price Discrimination

Third degree price discrimination may be practised between any two or more markets, separated from each other by geographical distance, transport barriers, legal restriction or inter-regional transport. Two markets must have different elasticity of demand.

Pricing Theories

In a complex business world, the business firms have to consider various factors while deciding the price for a product. There can be several strategies that can be adopted by a firm for deciding price like

- Cost-plus pricing
- Multiple product pricing
- Pricing in life-cycle of a product
- Transfer pricing

Cost-plus Pricing

- This is also known as “**mark-up pricing**”, “**average cost pricing**” and “**full cost pricing**”. This is the most common method of pricing used by the manufacturing firms. This method is based on the average variable cost of output which can be estimated for a given period of time, usually one fiscal year in which ‘Q’ output is produced

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

- A “mark-up” is fixed on this AVC which will be the profit margin. Suppose m = mark-up percentage, then price ‘ P ’ is calculated as $P = AVC + m (AVC)$

$$P = AVC (1 + m) = MC (1 + m)$$

(If MC is constant, MC = AVC)

Multiple Product Pricing

In actual practice, no firm can produce a single homogeneous product. Almost all firms produce a commodity in multiple models, styles and sizes, each so much differentiated from the other that every model or size of product can be taken as a new product. Each product has different AR and MR curves and that one product of the firm competes against the other product of same firm. The pricing under these conditions is known as multi-product pricing or product-line pricing. Since all the products are produced under one production facilities, they have one joint marginal cost curve but different AR and MR curves. If we sum-up, the intersection of combined MC curve and aggregate MR curve determines the output level and price for each product of the firm.

Pricing in Life-cycle of a Product

In the words of Kotler and Armstrong, “Product life cycle is the course of a products’ sales and profit over its life time.” How the product has performed in the market from introduction period to the declining period. A product passes through five stages. See fig. 29.

Introduction

Stage of launching the product in the market. This is a trial phase with constant sales.

Growth

Product gains popularity and sales increasing at fast pace due to cumulative effect of advertisement over the initial stage.

Maturity

Stage in which sales continue to increase but at a lower rate and the total sale tends to stabilize.

Saturation

Phase in which sales have reached their peak the total sale saturates there is no considerable increase or decrease in the sales.

Decline

This is the last stage in which sales begin to decline due to various reasons like availability of substitutes, loss of product uniqueness, change in fads and fashion, etc.

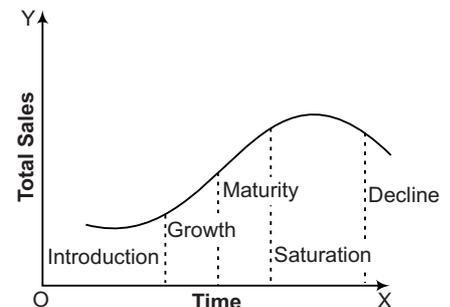


Fig. 29

Pricing for a New Product

Skimming Pricing

This strategy is adopted where close substitutes of a new product are not available. In this policy, firm intends to skim the consumer’s surplus off the market by setting a price initially high, then subsequent lowering of prices in a series of reduction. Initial high price should be accompanied by heavy sales promotion, distinct features of the product and demand is relatively inelastic.

Penetration Price Policy

This policy is implemented in case of new products which have close substitutes available in market. This policy requires fixing a lower initial price designed to penetrate the market as quickly as possible. As the product catches the sales in the market, price is gradually increased. It requires the demand elasticity greater than one. Economies of large-scale production should be available to the firm. Cross elasticity should be high for substitutes.

Veblen Effect

Also termed as **demonstration effect**, when the consumers are ready to buy goods of prestige at a very high price. This effect can be seen in malls.

Transfer Pricing

The goods and services produced by one division of a company is used by the other division of the same company for further production. In other words, parent division buys the product of its subsidiaries. There will be a problem of determining an appropriate price for the product transferred from one division to the parent body. Pricing of intra-firm “transfer product” is referred to as “transfer pricing”. This technique was provided by Hirshleifer. It was assumed that both parent and subsidiary companies have their own profit functions to maximize and firm has option to sell its product completely in external market and/or to transfer it to the parent company.

- The correct transfer price for an intermediate product for which there is no external market is the **Marginal Cost (MC)** of production.
- When a perfectly competitive external market exists, the transfer price for intra-company sales of the intermediate product is given by the external competitive price for the intermediate products.
- When an imperfect market exists, the transfer price is given at the point where the net marginal revenue of the marketing division of the firm is equal to the marginal cost of production division at the optimum level of output of the intermediate product.

Advertising

Advertising is any paid form of non-personal communication by an identified sponsor. Aim is sales promotion of goods and services to the mass customer.

Objectives of Advertising

- To create awareness and to tell the customers about utility of product.
- To persuade the customer, to convince the customer for buying.
- To remind and stimulate repeat purchase.
- To convince current customers that they are precious to the company.
- Advertising shifts the demand curve to the right and makes the demand curve less elastic.
- In the initial stages of advertisement outlay, the resulting increase in sales will be more than proportionate to the increase in advertisement expenditure. Beyond that point, rate of increase in sales decline. Finally, a stage will come where the sales become saturated and advertisement has no effect.

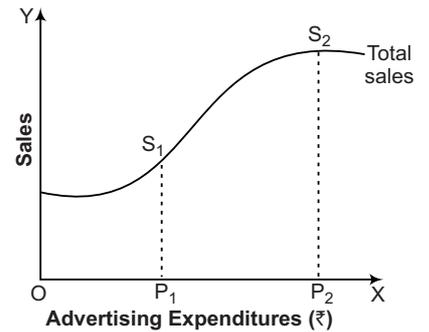


Fig. 30

Advertisement Elasticity of Demand

It measures the change in sales volumes (Q) in response to the change in advertising expenditure (A)

$$E_a = \frac{\Delta Q / Q}{\Delta A / A} = \frac{S_1 - S_2}{S_1} \div \frac{P_1 - P_2}{P_1}$$

P_1 and P_2 are two advertisement expenditures corresponding to S_1 and S_2 sales volume See fig. 30.

Factors That Influence Advertising Elasticity

- Stage of the product in market *i.e.*, if it is a new product or if few substitutes already exists.
- Period of advertisement *i.e.*, for how many days advertisement is done.
- Advertising by rival firms.

Capital Budgeting

- It refers to the process of planning capital projects, raising funds and efficiently allocating resources to those capital projects which are expected to generate returns for more than one year. These include setting up new plants, installing machines, purchase of heavy vehicles and trucks, purchase of IT products for office automation, expenditure on R and D work for product innovation. Expenditure on advertisement for long period can also be the part of capital expenditure.

Decisions Taken in Capital Budgeting are

- How much money to be raised, fund requirement?
- What could be the source of finances?
- Allocation of the money between different projects over a time period.

Types of Investments in Capital Expenditure

- Investment for replacing worn out machines.
- Investments on cost reduction by way of bringing new technology, buying more advance machines, training of manpower.
- Investment for expansion of plant capacity in response to increasing demand.
- Investment for introducing new products and to enter new market.
- Investment for complying with government regulations like safely hazards, waste management and social responsibility.

Capital Expenditure is Irrevocable

Once an investment is made in some project, it cannot be converted into cash without a loss. The very survival of the firm depends on planning of capital expenditure. Thus, only profitable projects must be selected for good returns on investment.

Methods for Evaluating Investment Returns

Pay Back Period

- This method is also called as payout method, calculates the total time period (in number of years) required to return the original investment. From this, the firm can find out the time period in which it can recover its invested funds. It does not take into account depreciation on the machines.

$$\text{Pay Back period} = \frac{\text{Total Investment}}{\text{Net cash Inflows per year}} = X \text{ year}$$

Net cash inflows = Gross profit – (tax + depreciation)

- In case of projects yielding cash inflow in varying amounts, pay-off period can be obtained through cumulative total of annual returns.

For Example Total fixed outlay is ₹ 20 Lacs, which yields cash flows over 6 years as shown in following Table

Year	Total Fixed Outlay (₹ In Lacs)	Annual Cash-Flows (₹ in Lacs)	Cummulative Cash Flows (₹ In Lacs)
1 st	20	2	2
2 nd	–	5	7
3 rd	–	6	13
4 th	–	7	20
5 th	–	6	26
6 th	–	8	34

From above table we can see that the pay-back period is 4 years as in 4th year, cumulative cash inflow equates with total outlay of ₹ twenty lacs.

Net Present Value Method

This method is based on the concept of time value of money. A money expected to be received one year later is less valuable than the same amount received today. This is due to the fact that we can earn interest on the money in hand in that time period.

Present value + Interest in 1 yr = Future value in 1 yr

$$FV = PV (1 + r)^t$$

where,

r = rate of interest

t = time period in yr

$$PV = FV \left[\frac{1}{(1+r)^t} \right]$$

where, FV = Future value
 PV = Present value
 PV = FV × (discounting factor)

Thus, present value of future income can be expressed as its value discounted at the current rate of interest.

For Example If we are going to receive ₹ 1100 after one year and the rate of interest is 10% per year.

$$PV = 1100 \left[\frac{1}{(1+0.1)^1} \right] = \frac{1100}{1.1} = 1000$$

Thus, present value of ₹ 1100 is ₹ 1000

In case of different annual returns (R) over n year with ‘r’ rate of interest, total present value of an income stream can be calculate as

$$TPV = \frac{R_1}{1+r} + \frac{R_2}{(1+r)^2} + \frac{R_3}{(1+r)^3} \dots + \frac{R_n}{(1+r)^n}$$

$$TPV = \sum_{i=1}^n R_n \frac{1}{(1+r)^n}$$

- Net present value NPV = TPV – Cost of investment

$$NPV = TPV - C$$

If NPV > 0, project is acceptable;
 If NPV = 0, project can be accepted or rejected
 If NPV < 0, project should be rejected.

Internal Rate of Return Method

This method is also called “discounted rate of return” or “time adjusted rate of return” method. Also termed as “Marginal efficiency of investment” and “Break-even rate”.

This is the rate of return which equates the total outlay on project with the total net present value of annual cash inflows.

$$\sum_{i=1}^n \frac{R_n}{(1+r)^n} = C$$

- IRR method says that so long as internal rate of return is greater than the market rate of interest, it is always profitable to borrow and invest.

Average Rate of Return Method

This method does not consider time factor. Average Return of Investment (ARI) is defined as the ratio of net average annual income from the project to the initial investment.

- Net average annual income can be calculated by dividing the total annual income of all years by the number of years of inflow.

$$ARI = \frac{\left[\sum_{i=1}^n R_n \right] / n}{C_o}$$

where, C_o = initial cost of project.
 R_n = annual return in nth year
 n = total number of years

Average Rate of Return in Percentage

$$\text{ARR} = \frac{\text{Average Return}}{\text{Average Total Cost of Project}} \times 100$$

In this method the rate of return on investment is calculated without considering time factor.

$$\begin{aligned} \text{ARR} &= \frac{\text{Average annual income after Tax and Depreciation}}{\text{Average investment}} \\ &= \frac{\text{Annual cash inflow after Tax - Depreciation}}{\frac{\text{Initial Investment} + \text{Salvage}}{2}} \times 100 \end{aligned}$$

For example, there is an initial outlay of ₹ 20000. Annual cash flow after tax but before depreciation is ₹ 3000 for first five years and ₹ 2000 for next five years. Estimated life is 10 years and salvage is ₹ 2000. Calculate average rate of return.

Solution Average annual cash inflow after tax = $\frac{5 \times 3000 + 5 \times 2000}{10} = ₹ 2500$

$$\text{Depreciation} = \frac{\text{Initial outlay}}{\text{Lift Period}} = \frac{20,000}{10} = ₹ 2000$$

$$\text{Average investment} = \frac{20,000 + 2000}{2} = ₹ 11000$$

$$\text{ARR} = \frac{2500 - 2000}{11000} \times 100 = 4.5\%$$

Profitability Index Method

It is the ratio of net present value of cash inflows to the present value of cash inflows to the present value of cash outflows. This index considers the time frame or discounted rate of return.

$$P_i = \frac{\text{Present value of cash inflows}}{\text{Present value of cash outflows}}$$

For example, Jain Tube Ltd. Co. is considering the purchase of a machine which is costing ₹ 100000. A discount rate of 10% is considered. Cash inflows after tax are as follows. Find out the profitability index

Year	Cash inflows (₹)	PV factor @ 10%
1	15000	0.909
2	20,000	0.826
3	20,000	0.751
4	10,000	0.683
5	5000	0.621

Solution Present value of cash inflows

$$\begin{aligned} &= 15000 \left[\frac{1}{(1+0.1)^1} \right] + 20000 \times \frac{1}{(1+0.1)^2} + 20000 \times \frac{1}{(1+0.1)^3} + 10000 \times \frac{1}{(1+0.1)^4} + 5000 \times \frac{1}{(1+0.1)^5} \\ &= 15000 \times 0.909 + 20000 \times 0.826 + 20000 \times 0.751 + 10000 \times 0.683 + 5000 \times 0.621 \\ &= 13635 + 16520 + 15020 + 6830 + 3105 \\ &= 55110 \end{aligned}$$

Present cash outflow = ₹ 100000

$$\text{PI} = \frac{55110}{100000} = 0.55$$

Capital Budgeting Decision

A firm can increase its efficiency either by expanding its operations or by reducing costs. This can be done by replacing worn out machines, renovation of plant, removal of obsolete technology, acquire fixed assets for current and new products. Thus, budgeting decisions are of two types

(i) To expand revenues by increasing operations

(ii) To reduce costs

The first decision has higher degree of uncertainty about future revenues than the second decision which can be checked at any stage by way of control.

National Income

It can be defined as the total monetary value of all final goods and services produced in a country during a period of one year. The essential condition is that only those goods and services were included which have market value. This is national income as product flows.

National Income as Money Flow

National income can also be calculated by adding all money flows due to production activity. This is done by adding all factor costs like wages, rents, interests, profits and earnings of self-employed.

Gross Domestic Product (GDP)

It is the money value of all goods and services produced within the domestic territory of a country during one financial year. These goods and services may be either consumer goods or capital goods. These may be produced in private sector as well as government sector. However, it does not include the value of intermediate goods and services. The profits earned or losses incurred on account of changes in capital assets as a result of fluctuations in market prices, are not included in the GDP, if they are not responsible for current production of the year.

Net Domestic Product (NDP)

$NDP = GDP - \text{Depreciation on fixed capital}$.

Gross National Product (GNP) = GDP + Net factor income from abroad

The concept measures gross product in the light of citizenship. GDP includes income generated by foreign citizens working in that country but does not include the income generated by the citizens of that country working abroad.

Net National Product (NNP) = GNP – Depreciation on capital

NDP is a geographical concept, while NNP is a national concept.

NNP at Market Price

It is the net value of final goods and services evaluated at current market price in one year after deducting depreciation on fixed capital.

NNP at Factor Cost

It is the sum total of all incomes earned by factors of production such as wages, salaries, rents, profits, interests, taxes, incomes of self-employed, etc.

$NNP \text{ at Factor Cost} = NNP \text{ at market price} - \text{Indirect taxes} + \text{Subsidies} = (\text{GNP at market price} - \text{Depreciation}) - \text{Indirect taxes} + \text{Subsidies} = \text{National Income}$.

Private Income

It is the income obtained by private individuals from any source, productive or otherwise and the retained income of corporations.

$\text{Private Income} = (\text{NNP at factor cost}) + (\text{Transfer payments}) - (\text{Deductions})$

Transfer payments include pensions, unemployment allowances, sickness, maternity and other social security benefits, gifts from abroad, windfall gains from lotteries and horse racing, and interest on public debt.

Deductions include income from government departments, surpluses of public undertakings, employee's contributions to the provident funds and life insurance, etc.

Private income = National income + Transfer payments for non-productive individuals – social security contributions – Profits of government departments – surpluses of public undertakings.

Disposable Income

It is that actual income which can be spent on consumption by individuals and families. The whole of the personal income cannot be spent on consumption because a certain part of the personal income is to be paid for direct taxes.

$$\text{Disposable Income} = \text{Personal Income} - \text{Direct Taxes.}$$

Real Income

It is national income expressed in terms of a general level of prices of a particular year taken as a base. National income is the value of goods and services produced as expressed in terms of money at current prices. But, it does not indicate the real state of the economy. It is possible that the net national product of goods and services this year might have been less than that of last year, but owing to an increase in prices, NNP might be higher this year.

To rectify such a mistake, the concept of real income has been propounded.

In order to find out the real income of a country, a year which has the general price level neither too high nor too low is considered as a base year and the price level of that year is assumed to be 100. Now the general level of prices of the given year for which the real NNP is to be calculated is assessed in accordance with the prices of base year.

$$\text{Real NNP} = \text{NNP for current year} \times \frac{\text{Base Year Index (100)}}{\text{Current Year Index}}$$

Per Capita Income

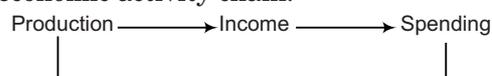
The average income of the citizen of a country in a particular year is called per capita income for that year.

$$\text{Per Capita Income for } N^{\text{th}} \text{ year} = \frac{\text{National Income of } N^{\text{th}} \text{ year}}{\text{Total Population in } N^{\text{th}} \text{ Year}}$$

This concept enables us to know the average income and the standard of living of the people. But, it does not give a clear picture of disposable income of common man as few nations have unequal distribution of national income with a wide gap between poor and rich.

Methods of Measuring National Income

Income arises out of the process of economic activity chain.



Production generates income; Income causes spending on goods and services; Spending in turn induces production. Accordingly, there are three different ways in which we can measure the size of the income.

- By measuring value of output produced—**Product Approach**
- By measuring income earned by factors—**Income Approach**
- By measuring the size of total expenditure—**Expenditure Approach**

Thus, we can look at national income as a flow of goods and services, a flow of income or a flow of expenditure.

Product Approach/Output Method

Total value of final goods and services produced in a country during a year is calculated at market prices to arrive at GDP at market price. Production from agriculture, forest, minerals from mines, goods produced by industries, contributions to production made by transport, communications, insurance companies, lawyers, doctors, teachers, hotels, entertainment, fisheries etc are collected and assessed at current market prices. Then,

Managerial Economics

depreciation is deducted to arrive at NDP at factor cost. Only the final goods and services are included and the intermediary goods and services, illegal productive activities are left out.

$$NNP_{FC} = NNP_{MP} + \text{Government Subsidies} - \text{Indirect Taxes.}$$

Income Method

Production of goods and services is an outcome of combined efforts of various factors of production like land, labour, capital and enterprise. Those factors get rewarded in form of wages, rent, interest, profit. Total income received by all the factors of production in an economy during a certain period is called factor income.

These factor incomes were classified into three broad categories.

- **Wage income/Labour income** Income received by employees either in cash or kind.
- **Capital income/Non-wage income** Income paid to factors of production, in form of interest on capital, rent on building, dividends, undistributed profit, interest on savings, bonus, royalties and profits of government enterprises.
- **Mixed income/Other income** Earnings like direct taxes collected by government, net factor income from abroad, value of production for self consumption.

$$\text{National Income} = \text{wage income} + \text{capital income} + \text{other income.}$$

- This approach is particularly appropriate for those activities whose output are difficult to value specially service sector.
- Transfer payments such as pension, unemployment allowance, subsidies, scholarships are not included in national income.
- Wealth tax, gift tax, capital gains tax on windfall profits, sales of shares, debentures and bonds should not be included in national income.
- Value of production for self-consumption should be included in national income.

Expenditure Method

It is based on the assumption that the income generated in an economy can be disposed either on consumption of goods and services or in investment. Thus, national income equals national expenditure.

- Components of final expenditure are
 - **Private consumption** Consumption of durable and non-durable consumer goods, utility services done by public.
 - **Private investment** Investment on capital goods like machines, plant setup, inventories, plots, houses.
 - **Government consumption** Expenditure on compensation of employees, social benefits like pension, unemployment allowance, etc.
 - **Government investment** Construction of dams, bridges, machines, transport vehicles, power plants, etc.
 - **Net foreign investment** All exports of merchandise and services minus all these imports in a year.
- Thus, expenditure method takes into account expenditure by houses hold, business houses and government institutions to determine the national income.
- Household sector includes individuals, all non-government, non corporate enterprises like sole proprietorship firms, partnerships and non-profit institutions.

Macro-economics

- The term macro-economics was first introduced by Ragnar Frisch in 1933. Macro-economics is a study and analysis of all the industries making an economy as a whole. It does not deal with economic problems of individual firms as is done in micro-economics.
- Macro-economics is the study of aggregates or average related to entire population and entire organisations involved in economic activities such as total employment, national income and output, total investment, total savings, aggregate demand and supply, general price level, general wage level etc.

Scope of Macro-economics

It covers various economic issues which concerns the nation at large scale. These are

- Theory of income and employment
- Economic fluctuations-inflation, deflation, stagflation
- International trade and economic growth.
- Causes of unemployment.
- Effect of investment on total output, total income and aggregate employment.
- Total supply of money and its impact on general price level.
- Balance of payments and foreign direct investment
- Analysis of national income.
- Growth and development of nation.

Importance of Macro-economics

The Ultimate Aim

Macro-economic studies is to formulate macro-economic policies. It helps in providing solutions to three most practical and critical problems any country is facing.

- **Problem of economic growth** To improve GDP, still developing nations like India has its GDP between 7 to 8% which is still very low.
- **Unemployment** This problem is being faced by developing as well as developed nations, now and then. Generating sustainable employment is a major challenge for developing nations specially in countries like India and China where population is very high.
- **Inflation** Continuous rise in the general price level of necessity goods is another problem facing nations especially country like India, where nearly one-fourth of the population still falls below the poverty line.

Macro-economic Paradoxes

Prof K E Boulding pointed out three possible macro- economic paradoxes *i.e.*, propositions which are true when applied to a single individual but they become false when applied to the economic system as a whole.

First Paradox-hoarding

The first paradox is that although an individual can accumulate cash balance by the process of hoarding (receipts exceed expenditures) money, it will be his saving. But if same process of hoarding is applied to the whole nation, it could disturb the aggregate demand for goods in the market.

Second Paradox-saving and Investment

An individual saves by the process of consuming less than what he produces, thus increasing his net worth. But, this decision may not result in saving but will lead to a decline in national output and income. The aggregate of saving is determined by the sum of decisions to invest in capital assets.

Thirds Paradox

It is concerned with profits, wages and their distribution.

Infrastructure

According to **Albert O Hirschman**, Social overhead Capital (SoC), also termed as infrastructure in common usage, is defined as all those basic services without which primary, secondary and tertiary productive activities cannot function.

In its wider sense, infrastructure includes

- Road and transportation
- Water and power supply
- Education
- Communication service
- Irrigation and drainage systems
- Law and order

Characteristics of Infrastructure

1. Infrastructure is a source of external economy. It helps the organisations externally in conducting economic activities like roads, power supply, telecom facility.
2. Infrastructure falls into the category of public utility goods. Public goods are provided by state for collective use by citizens .
3. Infrastructure creation involves heavy expenditure which are beyond the capacity of private organisation to setup.
4. Infrastructure development is a kind of investment which creates working conditions for factories to function. This promotes the innovation in society.
5. Infrastructure stimulates production on a large scale by big manufacturing units and make the product accessible to nationwide market.

Business Environment

- 'Business' can be defined as the planned and organised efforts of the enterprises to create and deliver value goods and services to the consumers.
- 'Environment' of business consists of all those factors, internal as well as external to which business is exposed and affected.
- 'Business Environment' refers to the summation of all the factors which are controllable (internal) as well as uncontrollable (external) by the organisation. These factors influence the business activity on large scale. *e.g.*, value systems of society, government rules and regulations, monetary and fiscal policies of government, employees in the organisation, customers, suppliers, etc.

Impact of Business Environment to Enterprise

Environmental Threats

Such as changing taste and lifestyles of consumers, intense competition, foreign direct investment, declining market sales etc.

New Opportunities

Exploring new market, bringing product innovation, replacing obsolete technology with latest technology, fulfilling unmet needs which have now arised with changing standards of living.

Types of Business Environments

Although, the term environment is generally used to refer to the external environment, which is uncontrollable by business organisations. Business firms have to adjust its internal environment to take advantages of its strength and opportunities and to fight with its weaknesses or threats in the business environment.

Internal Environment

The internal environment refers to all the factors within an organisation which are directly responsible for the growth or fall of the business unit. These are

- **Value systems** The value system refers to the business policies, the mission and objectives of the organisation, practices and procedures, priorities.
- **Management structure** It comprises of the board of directors, top level management executives. Their entrepreneurial skills and the extent of professionalism in approach to working affect the organisation.
- **Financial capability** Financial resources with the organisation, creditworthiness of the firm in the market, capital accumulation for long run functioning.
- **Marketing capability** Marketing and sales-force team, size of the market.
- **Manpower** All employees and their personal capabilities.
- **Technological capabilities** Availability of funds for Research and Development (R & D), technical know-how, latest machines, trained people.

External Environment

It includes all those factors which are outside the organisation, which cannot be controlled. These are again divided into two categories.

A. Micro Environment All those factors that directly influence the business organization. These factors, though external, are very important for an organization to exist. These include

- Suppliers
- Customers
- Competitors
- Intermediaries
- General public

B. Macro Environment It consists of all those factors which indirectly affect the enterprises functioning.

- **Economic environment** All businesses are affected by national and global economic factors. The climate of the economy dictates how consumers, suppliers and other organisational stakeholders such as financiers, creditors behave with the organisation. An economy undergoing recession will have high unemployment, low spending power and low stakeholder confidence. Conversely, a booming economy will have high spending power and high stakeholder confidence. Organisations have to employ strategies that protect and promote its business through economic conditions all over the world.
- **Social environment** It focuses its attention on forces within society such as family, friends, colleagues, neighbours and media. Social forces affect our attitudes, interests and opinion changes in the structure and lifestyle of population will affect the supply and demand of goods and services within an economy. If organisations do not respond to changes in society, they will lose market share and demand for their product and service.
- **Technological environment** Technological advances have greatly changed the manner in which business operate organisations use technology infrastructure such as internet, intranet or extranet to communicate with world. Multitude of software like ERP, SAP and hardware like blackberries, bluetooth devices have greatly increased the efficiency of business organisations. A faster exchange of information can benefit businesses as they are able to react quickly to changes within their operating environments.
- **Political environment** Political factors influence organisations in many ways. Government policies can create advantages and opportunities for and organisations conversely, they can place obligations and duties on organizations. Political factors include
 - Legislation such as minimum wage, anti-discrimination laws.
 - Voluntary codes and practices
 - Market regulations
 - Trade agreements, tariffs
 - Tax levies
 - Type of government regime

Quick Recap

A. Great Economists

- Adam Smith
- Ragnar Frisch introduced the term

Father of Economics

Micro and Macro Economics

- Marginal utility analysis
- Law of Diminishing Marginal Utility
- Demand paradox for inferior goods
- Consumer's Surplus
- "Value and Capital" book
- Theory of circular causation
- Indifference curve analysis
- Revealed Preference Theory
- Substitution effect
- Scientific touch to Indifference curve analyses

Alfred Marshall

Heinrich Gossen

Sir Robert Giffen

Marshall

JR Hicks

Ragnar Nurkse

Hicks and Allen

Samuelson

Hicks Allen

FY Edgeworth

Alfred Marshall

Adam Smith

Gunnar Myrdal

JK Galbraith

AC Pigou

Paul M Sweezy

Thorstein Veblen

Clark Wicksteed

Catherin

Mrs J Robinson

Freidrich List

JR Hicks

Jimmy Carter

- Principles of Economics
- Diamond Water Paradox
- Asian Drama
- Language of Economics
- Degrees of Price Discrimination
- Kinked demand curve hypothesis
- Demonstration effect
- Product exhaustion theorem
- Demand schedule at various prices
- Monopsony concept
- Infant industry Argument
- Social-Accounting concept
- Zero based budgeting

B. Basic Concepts of Managerial Economics

- Law of demand establishes qualitative or directional relationship between demand and price.
- Demand curve for a commodity is drawn on the assumption that the taste, income and price of other goods remain constant. This assumption is termed as "Ceteris Paribus".
- Perfectly elastic demand — $E_d = \infty$ (infinite)
- Perfectly inelastic demand — $E_d = 0$ (zero)
- Unitary elastic demand — $E_d = 1$
- Relatively inelastic demand $E_d < 1$
- Elastic demand, $E_d > 1$
- Exception to the law of demand— demonstration effect goods, Giffen's inferior goods, future scarcity of goods, ignorance of consumer.
- Demand curve moves downward due to law of diminishing MU and income effect.
- Elasticity of demand measures the responsiveness of demand to change in prices.
- Income elasticity $\epsilon_i = \frac{\Delta Q}{Q} \div \frac{\Delta y}{y}$ where $y =$ income $Q =$ Quantity demanded

$$\text{Arc elasticity } e_a = \frac{Q_1 - Q_2}{Q_1 + Q_2} \div \frac{P_1 - P_2}{P_1 + P_2}$$

- Movement along demand curve due to change in price causes expansion or contraction of demand.
- Shift in demand curve due to change in factors other than the price like income, taste, price of substitutes or complementary goods causes increase or decrease of demand.
- Production possibility curve is concave to origin because of increasing MRT (Marginal Rate of Transformation) between X and Y.
- In case of Giffen's goods, price effect is negative with increase in price, demand decreases.
- If demand curve is a rectangular hyperbola, elasticity is one.
- Cross elasticity of demand for substitutes is positive.
- Cross elasticity of demand for complementary goods is negative.
- When average revenue becomes constant, $AR = MR$
- The falling part of total utility curve shows negative marginal utility.
- Total utility is maximum when $MU = 0$.
- At the shut-down point, a firm is having all total losses equal total fixed cost, total revenue equal total variable cost, price is equal to average variable cost.
- The emphasis of managerial economics is on normative theory which is more of empirical study.
- Cobb Douglas production function is linear homogeneous production function of first degree presented as $P = K^{1/4}L^{3/4}C^{1/4}$.
- Condition of perfect competition firm's equilibrium — $MC = MR$, $MR =$ price, slope of MC should be greater than slope of MR. Long run equilibrium of the firm is established at minimum point of LAC.
- Long-run Average Cost curve (LAC) takes L-shape because of two reasons—Technological progress and learning by-doing.
- Under price discrimination, market having less elasticity of demand can be charged higher price.
- Economics of scale implies reduction, in unit cost of production.
- Law of equi-marginal utility — $\frac{MU_x}{P_x} = \frac{MU_y}{P_y} = MU_m$
- In case of unitary price elasticity of demand, total expenditure remains constant i.e., has no price effect.
- Diamond water paradox establishes the fact that marginal utility can be low but total utility will be high for necessary goods like water.
- $GNP = GDP +$ Net factor income from abroad.
- $NNP = GNP -$ depreciation
- Monopoly — single seller
- Bilateral monopoly—single seller, single buyer
- Monopsony—Single buyer, many sellers
- Duopoly—Two sellers, many buyers.
- Lerner's Degree of Monopoly Power = $\frac{P - MC}{P} = \frac{1}{e}$
- SAC is U shaped and more pronounced
- LAC is U shaped and less pronounced -envelope of SACs
- Stage of PLC - Introduction, growth, maturity, saturation, decline.
- $BEP \text{ (units)} = \frac{TFC}{P - MC}$

- Gossen's first Law– Law of diminishing marginal utility.
 - Gossen's second law–Law of equimarginal utility
 - Indifference curve is based on ordinal utility just as marginal utility analysis is based on cardinal utility.
 - L-Shaped indifference curve indicates perfect complementary goods with zero MR_{xy} .
 - Consumer's indifference curve for perfect substitutes is downward sloping straight line.
 - MRS_{xy} is decreasing–IC curve is convex to origin.
 - MRS_{xy} is zero – L- shaped IC curve (complementary goods)
 - MRS_{xy} is increasing – IC curve is concave to origin.
 - MRS_{xy} is constant–IC is downwards sloping straight line (substitutes)
- $MRS_{xy} = - \frac{\Delta y}{\Delta x}$
 - Smoothness and continuity of indifference curves means that goods in question are assumed to be perfectly divisible.
 - Budget line is the various combinations of the two commodities that a consumer can purchase at a fixed income level.
 - A consumer reaches equilibrium when $MU = P$
 - $e = \frac{AR}{AR - MR}$ or $MR = AR \left(1 - \frac{1}{e} \right)$
 - Revealed Preference Theory of Samuelson is based on strong ordering of observed consumer behaviour.

Factolight

(Based on Previous Years' Paper)

1. Demand curve under monopolistic competition is downward sloping and flat. [Jun 2005]
2. If two commodities are complementary, then a rise in price of one commodity will induce a backward shift in demand for the other commodity. [Jun 2005]
3. If the demand curve is rectangular hyperbola, the elasticity is unity. [Jun 2005]
4. Income is a flow variable where as product, capital formation and wealth is a static variable. [Jun 2005]
5. "Supply creates its own demand" is known as Says Law. [Jun 2005]
6. In the law of variable proportions, phase two indicates diminishing returns. [Dec 2005]
7. The demand curve facing the pure monopolist is negatively sloped. [Dec 2005]
8. Total consumer expenditure on a good falls as its price falls; this indicates that its price elasticity is less than one. [Dec 2005]
9. National income is NNP at factor cost. [Dec 2005]
10. A firm produces output using labour and capital. If prices of both inputs double, then the total minimum cost of producing any given level of output is doubled provided the firm has constant returns to scale technology. [Jun 2006]
11. In the long run a firm under perfectly competitive market earns only normal profit. [Jun 2006]
12. National income at current prices is equal to NNP at factor cost. [Jun 2006]
13. A monopolist always charges a price which is greater than marginal cost. [Jun 2006]
14. The Kinky demand curve hypothesis predicts sticky prices in the market. [Jun 2006]
15. Price elasticity of demand for luxury goods will be infinitely elastic. [Dec 2006]
16. In the short run, profit maximizing firm produces additional units of production, as long as marginal revenue exceeds marginal cost. [Dec 2006]
17. In the typical demand schedule, quantity demanded varies inversely with price. [Dec 2006]
18. Shut down point is that point where price is equal to variable cost. [Dec 2006]
19. Bank rate, CRR and trading of shares in open market are monetary policies but taxation is a fiscal policy. [Dec 2006]
20. The assumption that economic conflict between the organization leads to innovativeness and the new product development, technological advancement and better services at lower prices, refers to Cost Reduction strategy. [Dec 2006]
21. ISO Cost Line is also called as production line. [Jun 2007]
22. Quadratic cost function is written as $TC = a + bQ + cQ^2$ [Jun 2007]
23. Transfer pricing is referred to as price charged under intra firm transfer of product. [Jun 2007]
24. Margin of safety is above the break even point. [Jun 2007]
25. Profit is maximized when $MC = MR$. [Jun 2007]
26. The shape of short run average cost curve is U shaped. [Jun 2007]
27. Box-Jenkin is one of the important methods used in trend projection of sales forecast. [Dec 2007]
28. The Cobb Douglas production function has the equation $P = AK(a)L(1-a)$. [Dec 2007]
29. Skimming price for a new product is high initial price. [Dec 2007]
30. Under monopoly market structure, the degree of freedom in pricing decision is quite good. [Dec 2007]
31. Capital budgeting decisions are generally irreversible. [Dec 2007]
32. Intervention of the Government is not the pre-requisite of a perfect market. [Dec 2007]
33. The demand curve of a monopolistically competitive firm is highly though not perfectly elastic. [Jun 2008]
34. A decision maker has to remember the proverb, "a bird in hand is worth two in bush", while he examines Opportunity Cost principle. [Jun 2008]
35. Market with one buyer and one seller is called bilateral monopoly. [Jun 2008]
36. Cardinal measure of utility is required in Utility Theory. [Jun 2008]
37. In case of Giffen goods, price effect is positive. [Jun 2008]
38. The term opportunity cost refers to cost of one product in terms of production of others sacrificed. [Dec 2008]
39. Consumer's willingness to pay minus (-) actual payment is called Consumer's Surplus. [Dec 2008]
40. The pay-back period refers to the number of years a project takes to recover its investment cost. [Dec 2008]

41. In the case of Veblen goods, demand curve will slope upwards. [Dec 2008]
42. Monopolist can decide either price or quantity but not both. [Dec 2008]
44. Price elasticity of demand is best described as the rate of response of demand to a change in price. [Jun 2009]
45. Giffen goods are those goods for which demand increases as price increases. [Jun 2009]
46. The situation where market consists of only two buyers is known as Duopsony. [Jun 2009]
47. Short run cost curves are influenced by Laws of variable proportion. [Jun 2009]
48. The term opportunity cost refers to cost of one product in terms of production of others foregone. [Jun 2009]
49. The elasticity of demand indicates the rate of response of demand to a change in price. [Dec 2009]
50. A rightward shift in supply curve indicates an increase in supply. [Dec 2009]
51. The condition of equilibrium for the monopolist is $MR = MC$. [Dec 2009]
52. Price control leads to rationing and black marketing under perfect competition. [Dec 2009]
53. If both supply and demand increase by the same proportion, price remains constant. [Dec 2009]
54. During last five years, per capita income of India is increasing, that means national income growth of India is more than the population growth. [Jun 2010]
55. In the short-run firm considers the minimum of its average variable cost curve as shut down point. [Jun 2010]
56. The positive cross elasticity of demand between two products means two products are substitutes. [Jun 2010]
57. A monopolist always operates in the elastic segment of its demand curve. [Jun 2010]
58. The price elasticity of demand for any product in the long-run is more than its short run value. [Jun 2010]
59. Under perfect competition in the long run, all firms earn normal profits. [Dec 2010]
60. National Income at market prices is equal to NNP at Factor cost. [Dec 2010]
61. If there is a single buyer, it is called Monopsony. [Dec 2010]
62. Time value of money is considered for NPV, IRR but not for Pay-back method. [Dec 2010]
63. A firm is having increasing returns to scale means it is having decreasing costs. [Dec 2010]