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INDUSTRIAL ECONOMICS AND ACCOUNTANCY

B.Tech 3rd Sem, EC + CE

SOLUTION

Q1- Fill in the blanks

1- X axis (Demand/ quantity)
2- Y axis (Price)
3- Perfect competition
4- Monopolistic competition
5- Negative
6- Positive
7- Rent/ Machinery/tools/insurance
8- Labour/material/electricity
9- Fixed
10- Variable

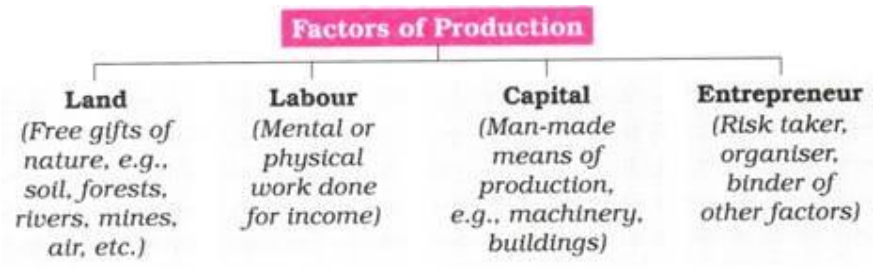
Q2- Total variable cost= 7000 Rs

Contribution= Selling Price- Cost= 4-0.5= 3.5 Rs

BEP (no. of units) = Total variable cost/Contribution= 7000/3.5= 2000 units

Percentage of maximum capacity = (10000/2000)*100= 20%

Q3-All factors of production are traditionally classified in the following four groups:



(i) Land:

- It refers to all natural resources which are free gifts of nature. Land, therefore, includes all gifts of nature available to mankind—both on the surface and under the surface, e.g., soil, rivers, waters, forests, mountains, mines, deserts, seas, climate, rains, air, sun, etc.

(ii) Labour:

- Human efforts done mentally or physically with the aim of earning income is known as labour. Thus, labour is a physical or mental effort of human being in the process of production. The compensation given to labourers in return for their productive work is called wages (or compensation of employees).
- Land is a passive factor whereas labour is an active factor of production. Actually, it is labour which in cooperation with land makes production possible. Land and labour are also known as primary factors of production as their supplies are determined more or less outside the economic system itself.

(iii) Capital:

- All man-made goods which are used for further production of wealth are included in capital. Thus, it is man-made material source of production. Alternatively, all man-made aids to production, which are not consumed/or their own sake, are termed as capital.
- It is the produced means of production. Examples are—machines, tools, buildings, roads, bridges, raw material, trucks, factories, etc. An increase in the capital of an economy means an increase in the productive capacity of the economy. Logically and chronologically, capital is derived from land and labour and has therefore, been named as Stored-Up labour.

(iv) Entrepreneur:

- An entrepreneur is a person who organises the other factors and undertakes the risks and uncertainties involved in the production. He hires the other three factors, brings them together, organises and coordinates them so as to earn maximum profit. For example, Mr. X who takes the risk of manufacturing television sets will be called an entrepreneur.
- An entrepreneur acts as a boss and decides how the business shall run. He decides in what proportion factors should be combined. What and where he will produce and by what method. He is loosely identified with the owner, speculator, innovator or inventor and organiser of the business. Thus, entrepreneur ship is a trait or quality owned by the entrepreneur.

- Some economists are of the opinion that basically there are only two factors of production—land and labour. Land they say is appropriated from gifts of nature by human labour and entrepreneur is only a special variety of labour. Land and labour are, therefore, primary factors whereas capital and entrepreneur are secondary factors.

Q4- The various factors affecting demand are discussed below:

1. Price of the Given Commodity:

It is the most important factor affecting demand for the given commodity. Generally, there exists an inverse relationship between price and quantity demanded. It means, as price increases, quantity demanded falls due to decrease in the satisfaction level of consumers. For example, If price of given commodity (say, tea) increases, its quantity demanded will fall as satisfaction derived from tea will fall due to rise in its price. The following determinants are termed as 'other factors' or factors other than price'.

2. Price of Related Goods:

Demand for the given commodity is also affected by change in prices of the related goods. Related goods are of two types:

(i) Substitute Goods:

Substitute goods are those goods which can be used in place of one another for satisfaction of a particular want, like tea and coffee. An increase in the price of substitute leads to an increase in the demand for given commodity and vice-versa. For example, if price of a substitute good (say, coffee) increases, then demand for given commodity (say, tea) will rise as tea will become relatively cheaper in comparison to coffee. So, demand for a given commodity is directly affected by change in price of substitute goods.

(ii) Complementary Goods:

Complementary goods are those goods which are used together to satisfy a particular want, like tea and sugar. An increase in the price of complementary good leads to a decrease in the demand for given commodity and vice-versa. For example, if price of a complementary good (say, sugar) increases, then demand for given commodity (say, tea) will fall as it will be relatively costlier to use both the goods together. So, demand for a given commodity is inversely affected by change in price of complementary goods.

Examples of Substitute and Complementary Goods:

Substitute Goods

1. Tea and Coffee 2. Coke and Pepsi 3. Pen and Pencil

4. CD and DVD 5. Ink pen and Ball Pen 6. Rice and Wheat

Complementary Goods:

ADVERTISEMENTS:

1. Tea and Sugar 2. Pen and Ink 3. Car and Petrol

4. Bread and Butter 5. Pen and Refill 6. Brick and Cement

For detailed discussion on substitute goods and complementary goods, refer Section 3.11.

3. Income of the Consumer:

Demand for a commodity is also affected by income of the consumer. However, the effect of change in income on demand depends on the nature of the commodity under consideration.

i. If the given commodity is a normal good, then an increase in income leads to rise in its demand, while a decrease in income reduces the demand.

ii. If the given commodity is an inferior good, then an increase in income reduces the demand, while a decrease in income leads to rise in demand.

Example:

Suppose, income of a consumer increases. As a result, the consumer reduces consumption of toned milk and increases consumption of full cream milk. In this case, 'Toned Milk' is an inferior good for the consumer and 'Full Cream Milk' is a normal good. For detailed discussion on normal goods and inferior goods, refer Section 3.12.

4. Tastes and Preferences:

Tastes and preferences of the consumer directly influence the demand for a commodity. They include changes in fashion, customs, habits, etc. If a commodity is in fashion or is preferred by the consumers, then demand for such a commodity rises. On the other hand, demand for a commodity falls, if the consumers have no taste for that commodity.

5. Expectation of Change in the Price in Future:

If the price of a certain commodity is expected to increase in near future, then people will buy more of that commodity than what they normally buy. There exists a direct relationship between expectation of change in the prices in future and change in demand in the current period. For example, if the price of petrol is expected to rise in future, its present demand will increase.

exceptions to the law of demand.

I. **Giffen Goods:** Giffen goods are the inferior goods whose demand increases with the increase in its prices. There are several inferior commodities, much cheaper than the superior substitutes often consumed by the poor households as an essential commodity. Whenever the price of the Giffen goods increases its quantity demanded also increases because, with an increase in the price, and the income remaining the same, the poor people cut the consumption of superior substitute and buy more quantities of Giffen goods to meet their basic needs.

For Example, Suppose the minimum monthly consumption of food grains by a poor household is 20 Kg Bajra (Inferior good) and 10 Kg Rice (superior good). The selling price of Bajra is Rs 5 per kg, and the rice is Rs 10 per kg, and the household spends its total income of Rs 200 on the purchase of these items. Suppose, the price of Bajra rose to Rs 6 per kg then the household will be forced to reduce the consumption of rice by 5 Kg and increase the quantity of Bajra to 25 Kg in order to meet the minimum monthly requirement of food grains of 30 kg.

II. **Expectation of Price Change in Future**: When the consumer expects that the price of a commodity is likely to further increase in the future, then he will buy more of it despite its increased price in order to escape himself from the pinch of much higher price in the future. On the other hand, if the consumer expects the price of the commodity to further fall in the future, then he will likely postpone his purchase despite less price of the commodity in order to avail the benefits of much lower prices in the future.

III. **Ignorance**: Often people are misconceived as high-priced commodities are better than the low-priced commodities and rest their purchase decision on such a notion. They buy those commodities whose price are relatively higher than the substitutes.

IV. **Emergencies**: During emergencies such as war, natural calamity- flood, drought, earthquake, etc., the law of demand becomes ineffective. In such situations, people

often fear the shortage of the essentials and hence demand more goods and services even at higher prices.

V. **Change in fashion and Tastes & Preferences**: The change in fashion trend and tastes and preferences of the consumers negates the effect of law of demand. The consumer tends to buy those commodities which are very much 'in' in the market even at higher prices.

Q5-

The price elasticity of demand:

The price elasticity is a measure of the responsiveness of demand to changes in the commodity's own price. If the changes in price are very small we use as a measure of the responsiveness of demand the point elasticity of demand. If the changes in price are not small we use the arc elasticity of demand as the relevant measure. The point elasticity of demand is defined as the proportionate change in the quantity demanded resulting from a very small proportionate change in price. Symbolically we may write

$$e_p = \frac{dQ}{Q} \Big/ \frac{dP}{P} \qquad (2.4)$$

or

$$e_p = \frac{dQ}{dP} \cdot \frac{P}{Q}$$

If the demand curve is linear

$$Q = b_0 - b_1 P$$

its slope is $dQ/dP = -b_1$. Substituting in the elasticity formula we obtain

$$e_p = -b_1 \cdot \frac{P}{Q}$$

which implies that the elasticity changes at the various points of the linear-demand curve. Graphically the point elasticity of a linear-demand curve is shown by the ratio of the segments of the line to the right and to the left of the particular point. In figure 2.33 the elasticity of the linear-demand curve at point F is the ratio

$$\frac{FD'}{FD}$$

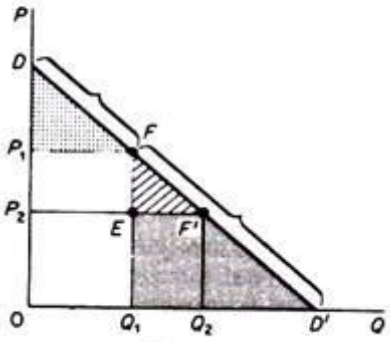


Figure 2.33

Proof

From figure 2.33 we see that

$$\Delta P = P_1P_2 = EF$$
$$\Delta Q = Q_1Q_2 = EF'$$
$$P = 0P_1$$
$$Q = 0Q_1$$

If we consider very small changes in P and Q, then $\Delta P \approx dP$ and $\Delta Q \approx dQ$. Thus, substituting in the formula for the point elasticity, we obtain

$$e_p = \frac{dQ}{dP} \cdot \frac{P}{Q} = \frac{Q_1Q_2}{P_1P_2} \cdot \frac{0P_1}{0Q_1} = \frac{EF'}{EF} \cdot \frac{0P_1}{0Q_1}$$

From the figure we can also see that the triangles FEF' and FQ_1D' are similar (because each corresponding angle is equal). Hence

$$\frac{EF'}{EF} = \frac{Q_1D'}{FQ_1} = \frac{Q_1D'}{0P_1}$$

Thus

$$e_p = \frac{Q_1D'}{0P_1} \cdot \frac{0P_1}{0Q_1} = \frac{Q_1D'}{0Q_1}$$

Furthermore the triangles DP_1F and FQ_1D' are similar, so that

$$\frac{Q_1D'}{FD'} = \frac{P_1F}{FD} = \frac{0Q_1}{FD}$$

Rearranging we obtain

$$\frac{Q_1D'}{0Q_1} = \frac{FD'}{FD}$$

Thus the price elasticity at point F is

$$e_p = \frac{Q_1D'}{0Q_1} = \frac{FD'}{FD}$$

Given this graphical measurement of point elasticity it is obvious that at the mid-point of a linear-demand curve e_p — 1 (point M in figure 2.34). At any point to the right of M

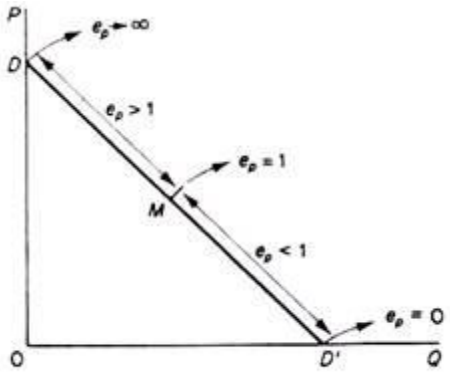


Figure 2.34

the point elasticity is less than unity ($e_p < 1$); finally at any point to the left of M, $e_p > 1$. At point D the $e_p \rightarrow \infty$, while at point D' the $e_p = 0$. The price elasticity is always negative because of the inverse relationship between Q and P implied by the 'law of demand'. However, traditionally the negative sign is omitted when writing the formula of the elasticity.

The range of values of the elasticity is

$0 \leq e_p \leq \infty$

If $e_p = 0$, the demand is perfectly inelastic (figure 2.35)

If $e_p = 1$, the demand has unitary elasticity (figure 2.36)

If $e_p = \infty$, the demand is perfectly elastic (figure 2.37)

If $0 < e < 1$, we say that the demand is inelastic.

If $1 < e < \infty$, we say that the demand is elastic.

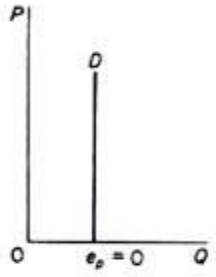


Figure 2.35

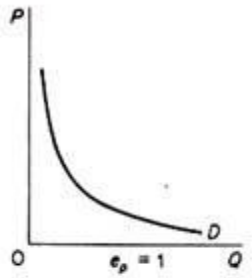


Figure 2.36

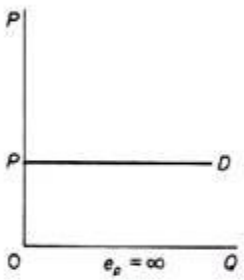


Figure 2.37

The basic determinants of the elasticity of demand of a commodity with respect to its own price are:

(1) The availability of substitutes; the demand for a commodity is more elastic if there are close substitutes for it.

(2) The nature of the need that the commodity satisfies. In general, luxury goods are price elastic, while necessities are price inelastic.

(3) The time period. Demand is more elastic in the long run.

(4) The number of uses to which a commodity can be put. The more the possible uses of a commodity the greater its price elasticity will be.

(5) The proportion of income spent on the particular commodity.

The above formula for the price elasticity is applicable only for infinitesimal changes in the price. If the price changes appreciably we use the following formula, which measures the arc elasticity of demand

$$e_p = \frac{\Delta Q}{\Delta P} \cdot \frac{\frac{P_1 + P_2}{2}}{\frac{Q_1 + Q_2}{2}} = \frac{\Delta Q}{\Delta P} \cdot \frac{(P_1 + P_2)}{(Q_1 + Q_2)}$$

They are elasticity is a measure of the average elasticity, that is, the elasticity at the midpoint of the chord that connects the two points (A and B) on the demand curve defined by the initial and the new price levels (figure 2.38). It should be clear that the measure of the arc elasticity is an approximation of the true elasticity of the section AB of the demand curve, which is used when we know only the two points A and B from the demand curve, but not the intermediate ones. Clearly the more convex to the origin

the demand curve is, the poorer the linear approximation attained by the arc elasticity formula.

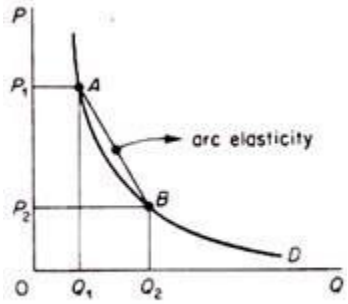


Figure 2.38

The income elasticity of demand:

The income elasticity is defined as the proportionate change in the quantity demanded resulting from a proportionate change in income. Symbolically we may write

$$e_Y = \frac{dQ}{Q} \Big/ \frac{dY}{Y} = \frac{dQ}{dY} \cdot \frac{Y}{Q} \qquad (2.6)$$

The income elasticity is positive for normal goods. Some writers have used income elasticity in order to classify goods into ‘luxuries’ and ‘necessities’. A commodity is considered to be a ‘luxury’ if its income elasticity is greater than unity. A commodity is a ‘necessity’ if its income elasticity is small (less than unity, usually).

The main determinants of income elasticity are:

1. The nature of the need that the commodity covers the percentage of income spent on food declines as income increases (this is known as Engel’s Law and has sometimes been used as a measure of welfare and of the development stage of an economy).

2. The initial level of income of a country. For example, a TV set is a luxury in an underdeveloped, poor country while it is a ‘necessity’ in a country with high per capita income.

3. The time period, because consumption patterns adjust with a time-lag to changes in income.

The cross-elasticity of demand:

We have already talked about the price cross-elasticity with connection to the classification of commodities into substitutes and complements (see section I).

The cross-elasticity of demand is defined as the proportionate change in the quantity demanded of x resulting from a proportionate change in the price of y. Symbolically we have

$$e_{xy} = \frac{dQ_x}{Q_x} \Big/ \frac{dP_y}{P_y} = \frac{dQ_x}{dP_y} \cdot \frac{P_y}{Q_x} \qquad (2.7)$$

The sign of the cross-elasticity is negative if x and y are complementary goods, and positive if x and y are substitutes. The higher the value of the cross-elasticity the stronger will be the degree of substitutability or complementarity of x and y. The main determinant of the cross-elasticity is the nature of the commodities relative to their uses. If two commodities can satisfy equally well the same need, the cross- elasticity is high, and vice versa. The cross-elasticity has been used for the definition of the firms which form an industry.