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Class - B.Com - Part-I.

Subject: Business Economics
and Environment

Topic: Iso-product curve

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Elasticity of factor Substitution:

Meaning:

The elasticity of substitution between factors in production relates the change in the ratio of factors used in a production process to a given change in the factor price ratio. An aggregate concept of such an elasticity relates a change in overall factor endowments to the resulting change in factor prices.

Acc to Hicks:

Elasticity of factor substitution "is a measurement of the ease with which the varying factor can be substituted for other".

The elasticity of labour substitution can be explained with the help of two factors - Capital (K) and Labour (L).

Ridge lines (with diagram) OR. Boundaries for the economic region of production :

[What are ridge lines? Explain with diagram?]

Meaning:

These lines are called ridge lines. They give the boundaries of the economic region of production where input substitution takes place. Any point on the isoquants outside the upper ridge line OR and the lower ridge line OR constitute uneconomic region of production. Production must take place inside the ridgelines.

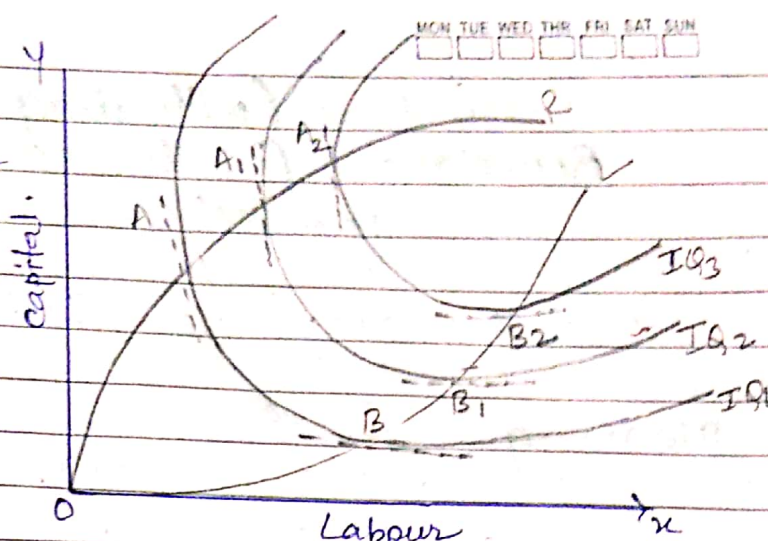
An isoquant represents combinations of two inputs that yield the same level of output. However, not all points of an isoquant are relevant for production. Such points may be called infeasible points. One should consider only feasible portions of an isoquant.

This is because of the fact that no rational producer will produce where marginal product of an input is either zero or negative.

If the isoquant is backward bending and upward sloping, marginal product of any input will be negative; and hence, this portion of the iso-quant will be considered as economically infeasible. Only the negatively sloped segment of the iso-quant is relevant for production or economically feasible.

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Combinations above OR and below OL constitute un-economic region of production



At point A on IQ_1 , the firm employs certain units of labour and capital. Since the tangent to IQ_1 at point A is parallel to the vertical axis, marginal product of capital (MP_K) is zero. If more capital is used, marginal product of capital should be negative. In other words beyond points A, MP_K is negative. At point B on IQ_1 , MP_L is zero and beyond point B on IQ_1 , MP_L is negative.

Thus, points between A and B represent positive marginal productivities of both labour and capital. Here substitution between two inputs takes place. Similarly points A_1 and A_2 on IQ_2 and IQ_3 describe zero MP_K , while points beyond A_1 and A_2 describe negative MP_K . Points B_1 and B_2 on IQ_2 and IQ_3 represent zero MP_L and beyond B_1 and B_2 describe negative MP_L .

A rational producer will produce in that region where marginal productivities of inputs are positive. By joining points A, A_1 and A_2 (i.e. points of zero marginal products.)

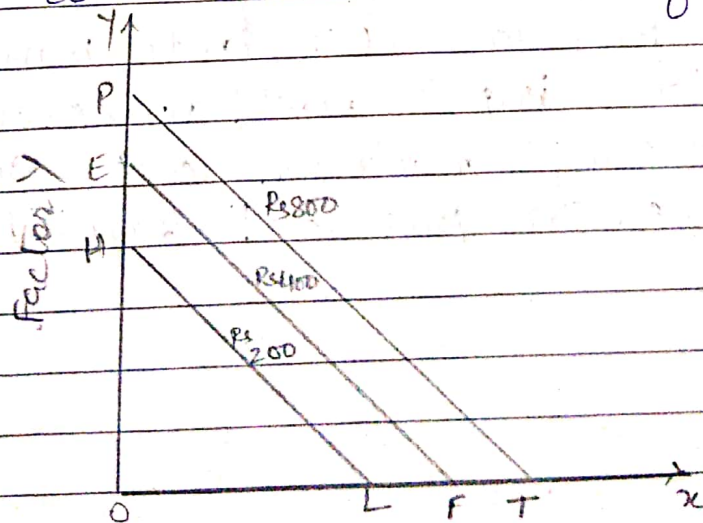
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we get OR line and by joining points B_1 and B_2 (points of zero marginal products). we get OL line. These lines are called ridge lines. They give the boundaries of the economic region of production where input substitution takes place.

Any point on the isoquants outside the upper ridge line OR and the lower ridge line OL constitutes uneconomic region of production. Production must take place inside the ridge lines. Note that the ridge lines separate the relevant (i.e. negatively sloped) from the irrelevant portions (i.e. positively or zero sloped) of the isoquants.

Iso-Cost Line OR Factor Price Line:

Iso-cost line represents the price of factors along with the amt of money an organization is willing to spend on factors. In other words, it shows different combinations of factors that can be purchased at a certain amount of money.



Factor X
Iso-cost line

For example, a producer wants to spend Rs 300 on the factors of production, namely X and Y. The price of X in the market is Rs 3 per unit and price of Y is Rs 5 per unit.

As shown in figure, if the producer spends the whole amount of money to purchase 100 units of X, which is represented by OL. On the other hand, if the producer purchases Y with the whole amount, then he/she would be able to get 60 units, which is represented by OH.

If points H and L are joined on X and Y axis respectively, a straight line is obtained which is called - iso-cost line. All the combinations of X and Y that lie on this line, would have the same amt. of cost that is Rs 300.

Similarly other iso-cost ~~lines~~ ~~Rs 300~~ lines can be plotted by taking cost more than Rs 300, in case the producer is willing to spend more amount of money on prodⁿ factors.

With the help of isoquant and iso-cost lines, a producer can determine the point at which input yield maximum profit by incurring minimum cost. Such a point is termed as producer's equilibrium.