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*B. Com part-1 subsidiary paper -1 Business Economics  
and Environment unit – 3 production function*

### **Q.3 What is the Cobb-Doughlas Production Function?**

**Ans.:** It considers only two inputs of production labour and capital.

$$Q = KL^\alpha C^{1-\alpha}$$

**Whereas,**

**Q = Quantity of Output**

**L = Quantity of Labour**

**C = Quantity of Capital**

**K = Positive Constants**

**(i) This function assumes that there are only two inputs of production:**

**Labour and capital and all the units of an input are identical and**

**homogenous.**

**(ii) 75% of increase in production is due to labour and 25% is due to Capital.**

**(iii) Nature of this function is linear and homogeneous i.e. if the Quantity of labour and capital is doubled, quantity of production Will also be double.**

**(iv) This function assumes perfect competition in the market.**

**(v) Returns to scale applies to manufacturing industry.**

### **Criticisms of Function :**

**(i) This function considers only two inputs of production.**

**(ii) This function is based on the assumption of constant returns to Scale which is not a real assumption.**

**(iii) This function is based on the assumption of perfect competition in The market which is also not a real assumption.**

**(iv) This function assumes that all the units of an input of production Are identical and homogeneous which is also not very much Practical.**

#### **Q.4 What is the Law of Variable Proportion (Law of Diminishing Return)?**

**Ans.: As we increase the quantity of any one input (say labour) which is Combined with a fixed quantity of other inputs, the marginal productivity Of a variable inputs starts declining after a limit.**

#### **Assumptions :**

**(a) Technology is constant.**

**(b) All units of the variable factor (say labour) are homogenous.**

**(c) There must be always some fixed inputs.**

**In the short run output may be increased by using more of the variable Factor(s), which capital (and possibly other factors as well) are kept Constant. The marginal product of the variable factor(s) will decline**

**Eventually as more land more quantities of this factor (S) are combined With other constants factor(s). The expansion of output with one factor (at least) constant is described by the law of (eventually) diminishing returns of the variable factors, which is often referred to as the law of Variable proportions.**

**From the figure it is clear that the total product (TP) curve increases to a Point and then decline. AP and MP curves first rise and then fall, the fall**

**In MP being more than that of AP curve. I**

**Thus the entire law can be understood in three stages as :-**

### **1<sup>st</sup> Stage – Law of Increasing Returns :**

**Meaning : When increase in output is in greater proportion than increase in inputs, it is known as the law of increasing returns. This law explains that when the quantity of a variable factor of production is increased, Marginal product shows an increasing tendency or in other words, total Product increases at an increasing rate.**

**The law of increasing returns is the state of production when the quantity of one or more factors of production is kept constant and the quantities of other variable factors are gradually increased, and corresponding return to an additional unit of variable factor goes on increasing. In the above figure, units of labour are shown on x-axis and Marginal and**

**V**

**Average products are shown on y axis, MP is Marginal product curve and**

**AP is average product curve. Both the MP and AP are increasing as the Units of labour are increased. It implies that total product is increasing at An increasing rate.**

**Causes of the Operation of Law of Increasing Returns :**

**(1) Economies of Division of Labour and Specialization**

**(2) Saving of Time and Improvement in the Technique of Production**

**(3) Economies of the Use of Specialized Machinery**

**(4) Managerial Economies**

## **(5) Economies of Buying and Selling**

### **Limitations of the Law of Increasing Returns :**

- (1) This Law Applies Only at Initial Stage : Law of increasing returns Applies only at the initial stage of production because at this stage, An increase in the variable factors of production leads generally to Improved productivity of labour and capital. Very soon this law Ceases to operate.**
  
- (2) This Law Cannot Continue Indefinitely : This law will apply only Upto the optimum ratio of factors of production is achieved.**

### **2<sup>nd</sup> Stage – Law of Diminishing Returns :**

**“With a fixed amount of any one factor of production, successive Increases in the amount of the other factors will after a point, yield a Diminishing**

**increment of the product leads average and marginal product Will eventually decline**

**Conditions or Causes of the Operation of Law of Diminishing Returns :**

**(1) Fixity of One or More Factors of Production**

**(2) Scarcity of Productive Resources**

**(3) Going Beyond the Optimum Combination of Factors of Production**

**(4) Factors of Production are not Perfect Substitutes for One Another**

**Limitations of the Law of Diminishing Returns :**

**(i) It is assumed that the state of technology remains unchanged.**



- (ii) It is assumed that the organizational structure and managerial Efficiency of the firm remain unchanged.**
  
- (iii) It is assumed that there are some inputs whose quantity may be Kept fixed and the quantity of other inputs may be changed, as Required. This law will not apply if all the factors of production are Proportionately changed.**
  
- (iv) All the units of variable factor are homogenous.**
  
- (v) The law is concerned with the physical quantity of product only And not with its value.**
  
- (vi) It is essential for the operation of this law that optimum Combination of resources of production must have already been Achieved because this law applies only after this stage.**

**(vii) It is also assumed that the factors of production, particularly Variable factors, are divisible as required.**

### **3<sup>rd</sup> Stage – Law of Negative Returns :**

**It explains the situation in which total product starts to decline and Marginal product becomes negative. No producer likes to get this Situation. He would discontinue to increase the quantity of variable**

**Factors of production because as soon as the quantity of variable factors of Production is increased under this stage, total product starts to decline And marginal product turns to be negative. This situation starts only after The point of maximum total product. This satiation can be improved by Reducing the quantity of variable factors of production.**