QUESTIONS

NUMBER ONE

(a) What are the main factors of production? (4 marks)

(b) (i) Define the term 'production function'

(2 marks)

(ii) What determines the supply and demand of the factors of production that you have identified in (a) above?

(14 marks)

(Total: 20 marks)

NUMBER TWO

(a) (i) State the law of variable proportions

(2 marks)

(ii) What key assumptions underlie this law?

(6 marks)

(b) Discuss fully the three main stages associated with the law (12 marks)

(Total: 20 marks)

ANSWERS

NUMBER ONE

(a) The main factors of production:

Factors of production are the economic means (economic resources or inputs) whose combination makes possible the availability of economic goods and services aimed at satisfying human material wants.

These factors of production take four different types, that is, Land, Labour, Capital and entrepreneur.

Land:-

It is a primary natural resource over which people have the power of ownership, control and disposal, and can be used to yield income or carrying out economic activities.

Land is a gift of nature whose supply is for all practical purposes fixed (no production cost) and whose reward is rent. It includes soil, mineral deposits and forests.

Labour:

Labour is the human physical and mental effort devoted to the production of goods and services.

It is a primary resource whose factor reward is wages (salaries)

Capital:

Capital is the stock of wealth or goods which are not required for their own sake but for further production of other goods.

Capital is either fixed such as machinery, buildings, motor vehicles; or working capital like stock of raw materials and work-in-progress. The factor reward for capital is interest.

Entrepreneur:

Is the organizing aspect of resource combination in a production process. It involves risking of capital and decision-making in anticipation of demand.

Entrepreneurial ability refers to the organizational skills which combine all other factors of production (resources) for productive use. The reward for entrepreneurship is profit.

(b) (i) A function is a mathematical relationship in which the values of a single dependent variable is determined by the value of one or several independent variables.

A production function is therefore a purely technical relationship in which the level of output is determined by the factor inputs. A production function thus represents a purely technical relation which connects factor inputs and outputs.It describes the laws of proportion, that is, the transformation of factor inputs into products (outputs) at any particular time period.

The production function represents the technology of a firm, an industry, or the economy as a whole. The production function includes all the technically efficient methods of production.

(ii) Determinants of supply and demand of factors of production:

Labour:-

Supply factors:

- Population size and structure – the working population
- Wage rate (remuneration)
- Mobility
- Education system – time
- Length of the working week (working days per week)
- Extent of barriers to entry into a particular profession or occupation eg ICPAK

- Political and economic stability
- Opportunity cost – leisure and work

Demand factors:

- Efficiency/productivity
- Wage rate
- Technology
- Availability of the other factors of production
- Demand for the goods that labour help produce (final goods)
- Mobility

Capital:-

Supply factors:

- Availability of credit
- Technical progress
- Domestic savings
- Level of output of goods and services
- External borrowing – banks, grants, gifts.

Demand factors:

- Cost of capital (interest rate)
- Marginal productivity/efficiency of capital
- Demand for the final product
- Stage of development (level of technology required)
- Level of anticipated output

Land:-

Supply of land is for all practical purposes fixed – reclamation may be made but this does not constitute any real increase in the supply of land i.e. more land can only be brought into use or increasing its productivity.

Demand factors:

- Cost of land – rent etc.
- Number of alternative uses
- Population size/growth rate
- Productivity

Entrepreneurship:

- The supply of entrepreneurship depends on a country's human resource development through education, specialized training, experience etc.
- The demand for entrepreneurship is determined by the level of economic activities in a country.

NB: The supply and demand of factors of production depend on the specific nature and aspects of a particular factor itself.

NUMBER TWO

(a) (i) The law of diminishing returns or variable proportions states that "as successive and equally

efficient units of a variable factor of production are added to a given quantity of a fixed

factor in the short-run and at constant technology, the total output/product (TP) will initially

increase at an increasing rate upto a point/level where it starts increasing at a diminishing rate

and eventually declines".

This means that the first unit of the variable factor of production will contribute most to the

total product and that each successive unit will contribute less than the one before. So

marginal product (MP) and average product (AP) of the variable factor will start falling as

diminishing returns set in but MP will fall faster than AP.

(ii) The law of variable proportions is based on the following assumptions:

- Equally efficient successive units of a variable factor
- Short-run – it operates within the short-run where at least one factor of production is fixed.
- Constant technology i.e. there should be no changes in production techniques.
- There must be a variable factor of production as well.

Total product is the total output arising from factor combination in a production process in the short-run.

Marginal product is the ratio of change in total product to the change in the units of the variable factor of production or change in total product per unit change in the variable factor of production:

MP = ΔTP/ΔL where L represents labour.

Average product is the total product per unit of the variable factor: AP = TP/L where L stands for labour.

(b) Diminishing returns takes the following four stages of production:

- Increasing returns
- Decreasing returns
- Constant returns
- Negative returns.

However, it's usually explained in terms of the three main stages:

I – Increasing returns

II – Decreasing/diminishing returns

III – Negative returns

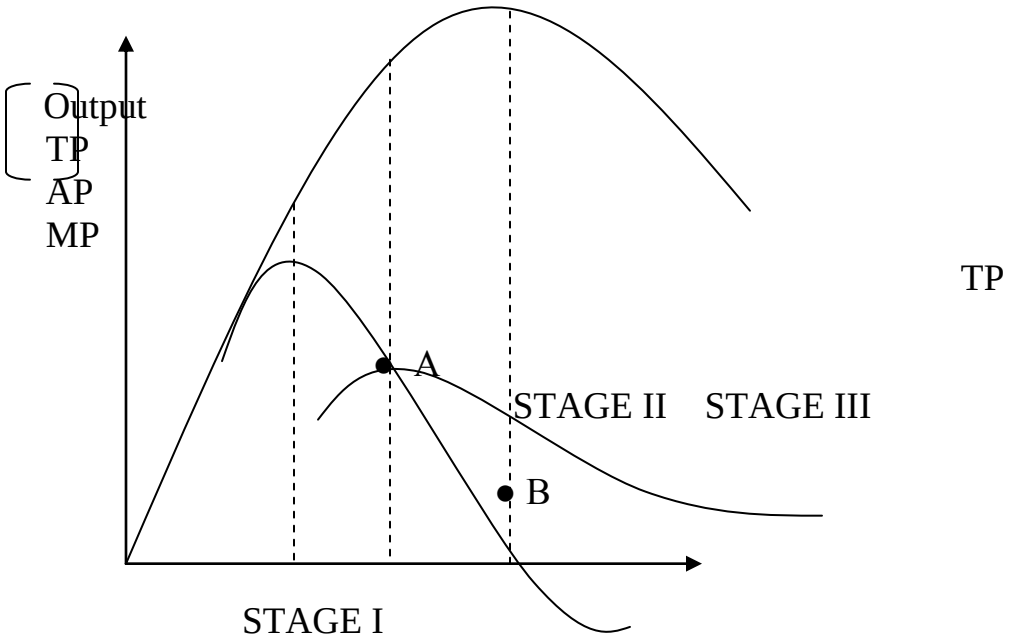

Fig 20.1: The three main stages of diminishing returns

Stage I:
This is the stage of increasing returns which involves varying the units of the variable factor input upto L_2.

- Both the marginal product and average product are positive

- Average product is increasing

Rising average product does not mean that the variable input becomes more efficient but with more units of the variable factor, it is possible to utilize the fixed factor more efficiently for example, through specialization and division of labour in the case of workers. Thus increasing productivity arises from the overall combination and is therefore applicable to all workers, particularly since labour units are homogenous.

As long as the average product is rising, efficiency is rising; thus at the employment of L_2 units of the variable factor (Labour in this case), the firm is at its most technically efficient level. This point is also defined by the intersection of the marginal product and average product curves, that is point B.

- Marginal product is initially increasing upto a point where it reaches a maximum (i.e. point A) and then starts to decline. Marginal product rises as the fixed factor is utilized more efficiently.
- Total product increases at an increasing rate as the marginal product is rising and then starts to increase at a decreasing rate as marginal product starts to fall.

Stage II:-

Stage II begins where the average product starts to fall upto the point where marginal product becomes zero. This stage is characterized by the following:-

- Both marginal product and average product are declining, with marginal product falling much faster.
- Declining average product indicates decreasing returns and thus decreasing efficiency. This comes about because each additional unit of the variable

factor has less and less of the fixed factor to work with.both marginal product and average product are positive.

- Total product is increasing at a decreasing rate and thus stage II is the stage of diminishing returns

Stage III:-

Stage III begins where marginal product becomes negative such that the total product begins to fall as well. AP continues to fall but remains positive. This is the stage of extreme inefficiency where factors of production are probably getting into each other's way, that is, at this stage the use value (according to the labour theory of value) is less than the exchange value of labour (i.e. price/wage rate is greater than the productivity/return)

Firms will thus find stage economically efficient because marginal product and average product are positive and declining. Additional units of the variable factor of production will increase total product at this stage.

The law of variable proportions does not take into account the aspect of cost of production. The only relevant cost is that of labour, the cost of the fixed factor is irrelevant as this is a S-R model. Therefore, in order to determine the most profitable way of combining factors of production prices and productivity of the factors must be considered. So far, the emphasis has been on the physical productivity of the variable factor (eg labour) although entrepreneurs are more concerned with economic efficiency and they will therefore measure output and input in monetary terms. Inputs will be measured as costs and output as revenue.

The concern/objective is the maximization of the difference between cost and revenue and NOT the productivity (in terms of the physical aspect of output) of the variable factor, especially if its relatively cheaper.

The law of diminishing returns is important in that it is seen to operate in practical situation where its conditions are fulfilled. Thus, in a number of developing countries with peasant agricultural economies, population is increasing rapidly on relatively fixed land, and with unchanging traditional methods of production. Consequently, productivity in terms of output per head is declining and in some cases total productivity is falling.

Also the law is relevant in explaining the least-cost-factor-combination aspect of a production process, which is achieved when a firm maximizes the productivity of the most expensive factor of production. Productivity is measured in terms of output per unit of a factor. Thus, if the variable factor is the most expensive, the firm should employ it until the AP is at the maximum. However, if the fixed factor is most expensive the firm should employ the variable factor up to the level where TP is at its maximum.