

Production & Cost

UNIT - PRODUCTION & COST

The same

- * Nature and factors of production
- Inputs Transformation Outputs
(production)

Production: The creation or addition of value or wealth. It may consist not only of goods but also of the services of doctors, teachers etc.

Production Function: It refers to functional relationship between input and output.

For various quantities of production, Max. quantity of output that can be produced

$$* q = f(x_1; x_2)$$

It means by using x_1 , amount of factor 1 and x_2 , amount of factor 2 we can Max. produce q amount of commodity.

$$\text{e.g. } 1240m = f(5L, 6k)$$

It says that maximum 1240 units of commodity 'm' can be

produced by unit using 5 units of labour (L) and 6 units of capital (K).

* Factor of production :-

- (i) Land :- By land, we mean not merely soil, as is commonly understood, but all natural resources on land, in water and air available to man. It stands for natural resources.
- (ii) Labour :- Labour means not merely the work of a coolie or of an unskilled labourer but all type of work, mental and manual, undertaken for getting an income. Any type of work undertaken for earning an income is called labour.
- (iii) Capital :- Capital means not only cash used in business but it also includes tools, machinery and machi appliances used in production.
- (iv) Organisation :- Organisation or enterprise is the work of bringing to above three factors together and making them work harmoniously.

* Characteristics of Land :-

- (i) Limited supply
- (ii) perishable
- (iii) immobile
- (iv) Heterogeneous

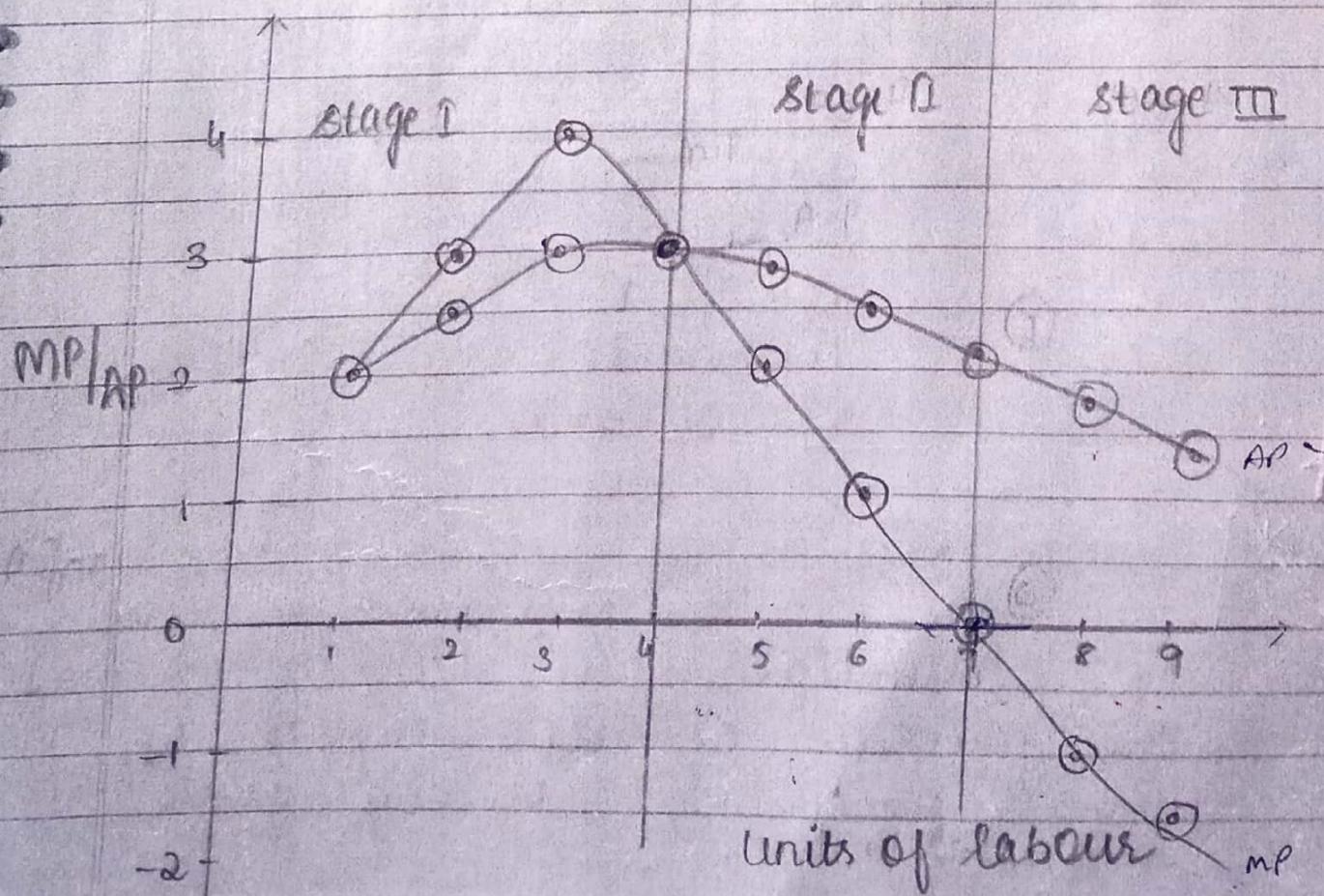
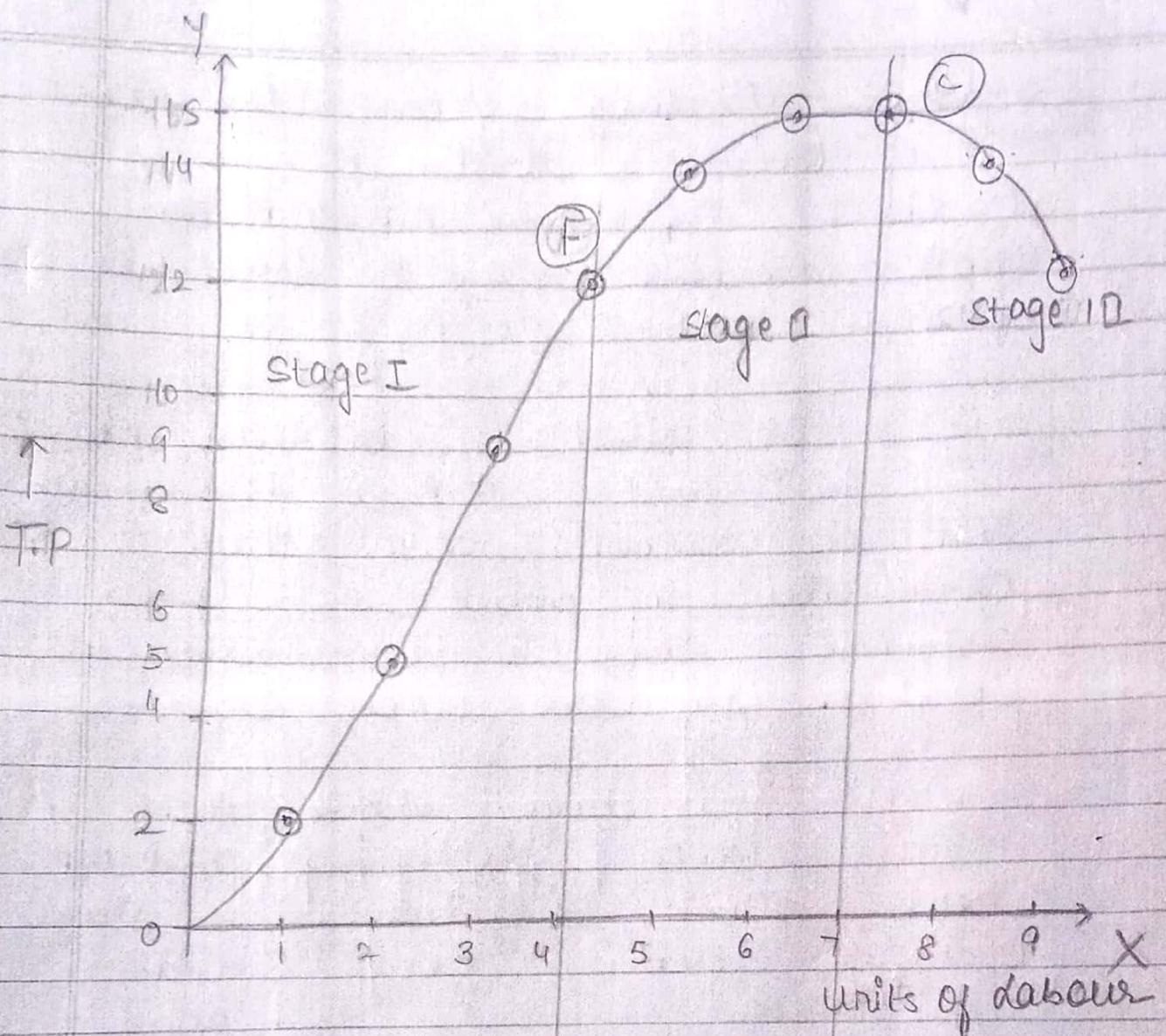
* Factors affecting productivity of Land :-

- (i) Natural factors
- (ii) Human factors
- (iii) Passive factor of production
- (iv) Alternative uses

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Law of Variable proportion :- (Short Run)
 In short period when the output of product is sought to be increased by way of additional application of variable factor to given quantity of fixed factor.

| Units of land | Units of labour | T.P | M.P | A.P | Information |
|---------------|-----------------|-----|-----|-----|---|
| 1 | 1 | 2 | 2 | 2 | Stage I (stage of Increasing Returns) |
| 1 | 2 | 3 | 5 | 3 | MP = A.P |
| 1 | 3 | 6 | 9 | 3 | |
| 1 | 4 | 10 | 12 | 3 | |
| 1 | 5 | 14 | 14 | 2.8 | Stage II (stage of Diminishing Returns) |
| 1 | 6 | 15 | 1 | 2.5 | MP falls till it is 0 |
| 1 | 7 | 15 | 0 | 2.1 | T.P Max & Constant |
| 1 | 8 | 14 | -1 | 1.7 | Stage III (stage of Negative Returns) |
| 1 | 9 | 12 | -2 | 1.4 | MP become -ve |

I can't + ?



Stage I :- Starting from the point origin and it ends at point I, where A.P = M.P for upper segment. Stage I stretches between origin to P.

Stage II :- It stretches between point I and C. M.P is decreasing till it becomes zero. Stage II terminates at point C in lower segment. Stage II terminates at point G in the upper segment.

Stage III :- This stage starts where T.P starts declining and M.P turns start negative. This stage operates from point I and C in lower segment and point G in upper segment.

Stage I $O \rightarrow P$

$O \rightarrow I$

Stage II $O \rightarrow G$

$O \rightarrow J | C$

Stage III G onwards

C | J onwards

~~★ ★~~ Law of Returns to Scale :-

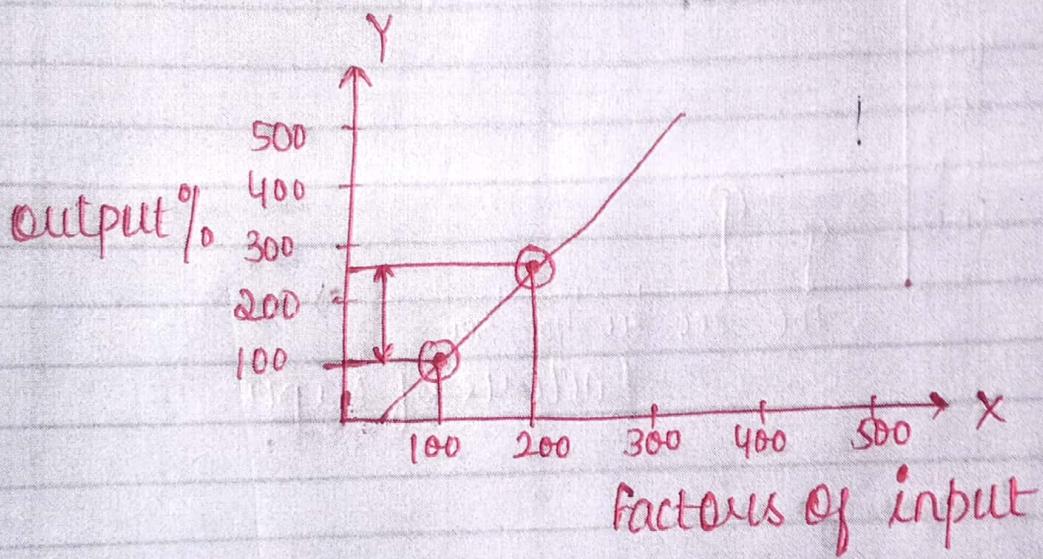
To increase in level of production one has to increase the quantity of all inputs by same percentage] or by same

proportion

Increasing

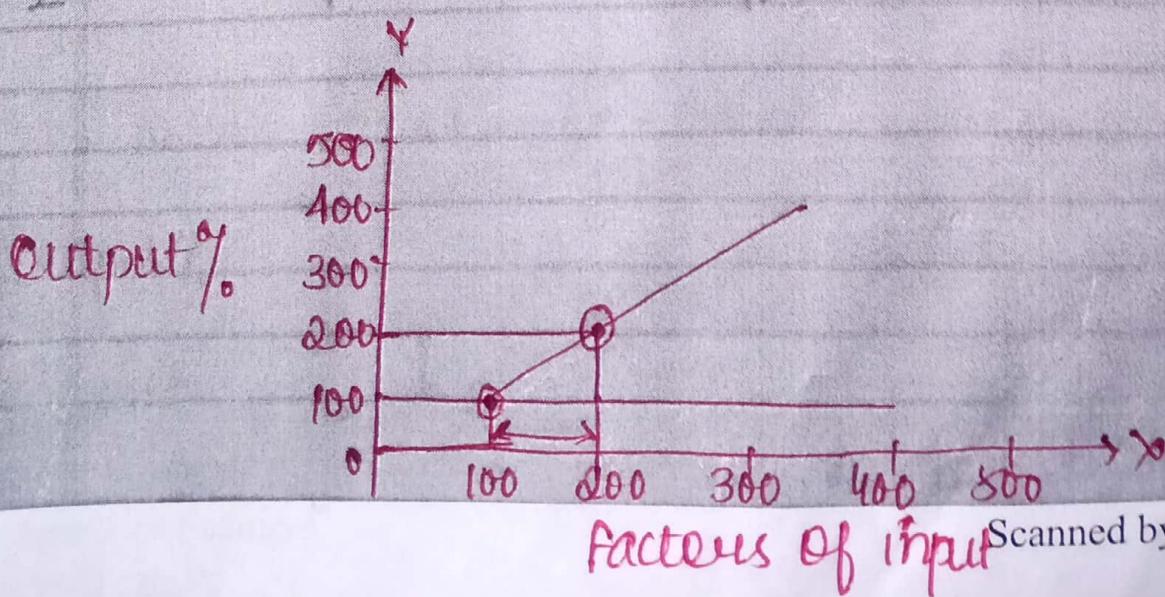
Returns to scale :-

| Units of labour | Units of land | % of land and labour | TP (units) | % P.L |
|-----------------|---------------|----------------------|------------|-------|
| 1 | 2 | - | 100 | - |
| 2 | 4 | 100% | 250 | 150% |



(ii) constant Returns to scale :-

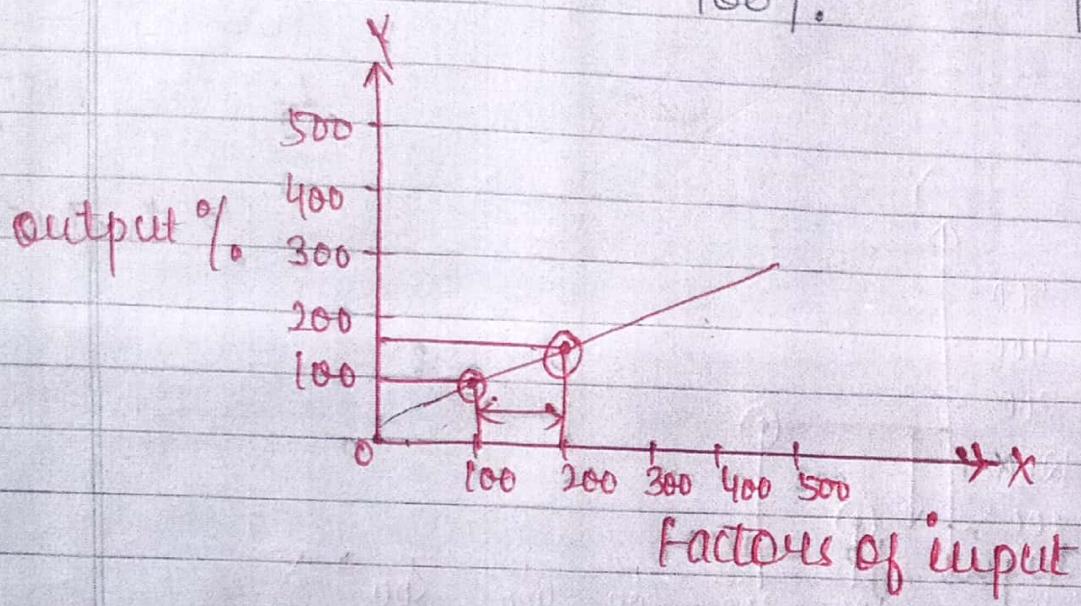
| Units of labour | Units of land | % of land and labour | TP (units) | % P.L |
|-----------------|---------------|----------------------|------------|-------|
| 1 | 2 | - | 100 | - |
| 2 | 4 | 100% | 200 | 100% |



(iii) Decreasing

Retrvenue to scale :-

| Units of labour | Units of land | % ↑ inland and labour | T.P (units) | % ↑ in T.P |
|-----------------|---------------|-----------------------|-------------|------------|
| 1 | 2 | - | 100 | - |
| 2 | 4 | 100% | 150 | 50% |



* Land :-

According to definition land counts of

- (i) upper surface of crust, its properties, and forest or other plants growing on it.
- (ii) Mountains, oceans, rivers, lakes, ponds and things found in them.
- (iii) Minerals found under earth.
- (iv) Climate, wind, sunshine, heat etc.

* Characteristics of Land :-

- (1) Land is limited in supply. It is

important to increase land because man can't create land.

- (2) A free gift of Nature - Land
- (3) Land is not perishable - The land surface of earth is not destructible
- (4) Land is heterogeneous it is not same every where
- (5) Land is immobile of all factors of production land is totally immobile.

* Productivity of Land :-

The power of particular plot of land to produce something is called productivity.

* factors determining productivity of land :-

- (i) Natural Factors :- Productivity depends on its natural resources e.g- slope of land, the chemical and biological properties of soil, its climate etc
- (ii) Human Factor :- Land can't produce itself man has to do labour on it. Productivity depends on the knowledge and training of workers.
- (iii) Organisation :- To increase productivity of land trained workers

implements, scientific methods, good seeds, manure and dependable sources of irrigation.

- (iv) Situation of land :- If the land is situated near the big cities or in industrial area have higher productivity.
- (v) Irrigation :- Irrigation is very important factor affecting land productivity.
- (vi) Availability of Capital :- With more capital we can use much better techniques for land irrigation.
- (vii) Land development :- Productivity of land depend on land development on the measure like well or tubewell, irrigation, proper drainage, fencing and building.

* Labour :-

Labour is any type of manual or mental activity done with a view to having a reward.

* Characteristics of Labour :-

(i) Human factor :- A labour has human

feelings and therefore must be treated like human and with dignity If employer does not treat labour properly then he will not be loyal to him.

- (ii) Active factor :- Labour is an active factor of production.
- (iii) A Perishable factor :- If a worker does not work for a day his working hours are lost for ever so it is a perishable factor.
- (iv) Mobility factor :- Labour can go from one place to another. It is a mobile factor.
- (v) Difference in efficiency :- All workers are not equally efficient some are trained and more efficient whereas others are not.
- (vi) Both a means and an end :- It is both the means of production and its end. He produces goods and consumes them.
- (vii) Capital can be invested in labour :- The capital can be invested to increase the efficiency of workers by providing the proper

training and education.

* Efficiency of Labour:-

A labourer's efficiency is the quality and quantity of goods and services he can produce over a given time period, under certain conditions.

* Factors Affecting Efficiency of Labour:-

(i) Racial Qualities:- A worker's efficiency depends to some extent on the racial blood to which he belongs. Workers from north Indian states of Punjab and Haryana can do physical work much better than workers from Bengal or the southern states. However, workers from south are more educated and skilled.

(ii) Standard of living:- The standard of living enjoyed by a worker also affects his efficiency. If workers get good food and leisure, their physical power and mental capacity increases because they do not easily fall ill. Indian workers are less efficient mainly because of their low standard of living.

(iii) Education: The level of general education and particular training of a worker determines his efficiency. A technically trained worker can handle machines much more easily. His efficiency is higher. Technical training further depends upon general education.

(iv) Hours of work: Long hours of work without lunch or tea break reduce a worker's efficiency.

(v) Labour laws: If government enacts labour laws regulating hours of work, wages and their payment, social security etc workers' efficiency increases due to reduced strain on their mind.

(vi) Trade Unions: Organisation of workers has also some effect on a worker's efficiency. Good trade union leaders induce greater discipline, get higher wages and promote the welfare of workers. Unorganised labour is not much reliable.

Ques: Why is the efficiency of Indian workers low?

Ans: (i) Indian workers are in the environment which is not good for efficient work.

- (ii) Indian worker is poorly fed and ill clothed.
- (iii) He lives in unhygienic condition.
- (iv) His family is poorly fed and a constant source of worry for him.
- (v) He is easy prey to ailments of different types.
- (vi) Trade unions are divided oftenly on caste and politics.
- (vii) Majority workers are illiterate so training can't be given to them.

* Division of Labour :-

Different workers do the different works.

Division of labour is specialisation from individual point of view and co-operation from community point of view.

With help of specialised implement a task is divided into number of jobs for different workers. This is called division of labour.

e.g. The Manufacturing of shoe is divided as treating the leather, preparing the upper part, heel, sole and combining all these and finishing.

* Forms of Division of Labour :-

- (i) Simple division of labour :- One task is done by two or more persons which one can't do easily. e.g. pushing a bus to start it, lifting logs of wood, cutting of crops etc.
- (ii) Occupational division of labour :- In it only one person performs the task of particular operation.
e.g. - Carpenters and blacksmiths in Indian villages.
- (iii) Complex division of labour :- Each person under takes a specialised function which contributes to final results.
- (iv) Territorial or geographical division of labour :- The localisation of particular productive activities in particular area is Territorial or geographical division of labour.
e.g. - The localisation of textile in Bombay, jute industry in Bengal and sugar industry in U.P.

* Capital :-

Capital is wealth which

yield an income or aids the production of an income as it intends to do so.

Q.

Capital consists of those kind of wealth other than free gifts of nature which yields income.

* Characteristics of Capital :-

- (i) Man-Made Factor :- Capital formation takes place by savings done by man. Therefore, capital is called stored up labour.
- (ii) Depreciation :- When capital is used for production it depreciates depending on durability of Capital asset. Therefore provision must be made for replacing it.
- (iii) Mobile Factor :- Capital is most mobile factor of production.
- (iv) Passive Factor :- Capital is unable to produce without land and labour.
- (v) Elastic Supply :- The supply of Capital

through higher savings and diminished when there is no provision for depreciation.

(vi) Capital depends on technology of production:- The more progressive is a country's technology the more capital intensive is the method of production.

* Entrepreneur:- The entrepreneur are the owner of the business who contribute the capital and bear the risk of uncertainty in business life. They may be sole traders limited partners and shareholders.

or

A person who set up a business or businesses taking on financial risks for profits.

* Cost Analysis

* Cost:- The cost of production of commodity is aggregate of price paid for factors of production used in producing that commodity.

* Real Cost:- The overall actual expense involved in creating a good or service for sale to consumers. The real cost of production

for a business typically includes the value of all tangible resources such as raw material and labour that are used in production process.

- * Opportunity Cost :- It refers to the value that we have to give up in order to choose something else.

Or

The opportunity cost of producing one unit of commodity X is the amount of commodity Y that must be sacrificed in order to use resources to produce X rather than Y.

- * Money Cost :- When production is expressed in terms of monetary units it is called money cost.
It is the monetary expenditure on inputs of various kinds - raw materials, labour etc. required for output.
- * Explicit Cost :- Explicit costs are direct monetary payment incurred through market transactions.
e.g. cost of raw materials, wages and salaries, power charges

* Implicit Cost :- It is any cost that has already incurred and is not necessarily shown or reported as separate expenses.
e.g., Wages of labour rendered by entrepreneur himself, interest on Capital Rent on Land.

* Economic Cost = Accounting Cost (Explicit Cost) + Implicit Cost.

* Price :- Price is the quantity of payment or compensation given by one party to another in return for one unit of goods or service.

or
The amount of money expected, required or given in payment for something

* Profit :- Profit is a financial benefit that is realized when the amount of revenue gained from a business exceeds expenses, costs and taxes needed to sustain the activity.

* Replies :-

* Fixed Cost :- Fixed Cost are incurred as a result of the use of fixed factor inputs. They remain fixed at any level of output in the short run.

e.g. payments of rent of building, interest paid on capital, insurance premiums, depreciation and maintenance allowances.

Cost remaining unchanged when output varies.

- * Variable Cost (or Prime Cost) :- Variable costs are those costs that are incurred by the firm as a result of the use of variable factor inputs.
e.g. Price of raw material, wages of labour, fuel and power charges.
- Cost varying with output variation.

- * Total Cost (TC) :- Total cost is the aggregate of expenditure incurred by the firm in producing a given units of output.

$$\text{Total Cost} = \text{Total Fixed Cost} + \text{Total Variable Cost}$$
$$(TC) = (TFC) + (TVC)$$

- * Total Fixed Cost (TFC) :- Total fixed cost corresponds to fixed inputs in short run production function. It is obtained by summing up the product of quantities of

fixed factors multiplied by their respective unit prices.

- * Total Variable Cost (TVC) :- It is obtained by summing up the product of variable quantities of input multiplied by their prices.
- * Average Cost :- Average Cost or unit cost is equal to total cost (TC) divided by number of goods produced (the output quantity, Q).
- * Average Fixed Cost (AFC) :- Average fixed cost is total fixed cost divided by total units of output.

$$AFC = \frac{TFC}{Q}$$

Q = No. of units of products

- * Average Variable Cost (AVC) :- It is total variable cost divided by total units of output.

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

- * Average Total Cost (ATC) :- Average total cost or average cost is total cost divided by total units of output.

$$ATC = AC = \frac{TC}{Q} \quad (TC = TFC + TVC)$$

- * Marginal Cost (MC) :- The marginal cost is also a per unit cost of production.
or
Marginal cost is the cost of production of extra unit of output.
or
The additional costs related to each successive unit wise increment in total output.

$$MC_n = TC_n - TC_{n-1}$$

$$MC_n = \frac{TC_n - TC_{n-1}}{1}$$

- * Total Productivity :- It represents the value of total output divided by the cost of all input.

$$\text{Total productivity} = \frac{\text{Total output}}{\text{Cost of all inputs}}$$

- * Cost Curves

- * Total Cost in Short Run :- In short run only variable inputs (factors) are changed and fixed inputs (factors) like land are not changed.

$$TC = TFC + TVC$$

Total fixed cost (TFC) is the amount spent on purchase of fixed factor, TVC is the amount spent on total variable factors. TC is the total cost.

* Table :-

| Output | TFC(Rs) | TVC(Rs) | TC(Rs) |
|--------|---------|---------|--------|
| 0 | 60 | 0 | 60 |
| 1 | 60 | 100 | 160 |
| 2 | 60 | 180 | 240 |
| 3 | 60 | 240 | 300 |
| 4 | 60 | 340 | 400 |
| 5 | 60 | 500 | 560 |
| 6 | 60 | 720 | 780 |

