3-01-'18

UNIT-III : PRODUCTION AND COST ANALYSIS

Demand in economics comes after supply, and before supply, the production function takes place.
Production Function → Supply → Demand.

Production

The definition of production in economics is transformation of inputs into outputs. Production function is associated (limited) only to the manufacturing in business.

The basic ~~of~~ aim of production is satisfying the need of goods and services. ~~Production~~ is

All those things which a firm or organization buys and employs to produce a particular product are called the 'inputs'.

The goods and services which are produced in a finished form are called the 'outputs'.

Eg. Cotton Yarn (Raw Material), Cotton ~~Yarn~~ Threads (Semi Finished Goods), Cotton Garmore (Finished Goods).

Production includes transporting, Banking and Insurance also.

NOTE: In economics, Rs.100 is more liquid than a bottle of water. Liquid money is that which is readily available to invest →

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Factors of Production

Factors of Production are productive resources used in production for a product. Factors of Production include:
i) Land ii) Labour iii) Capital iv) Organization (know)

Land is a natural resource which is limited in nature. It has exchange value, i.e., it can be bought and sold. It is fixed in quantity. It lacks mobility. The value of land differs depending on demand and supply and facilities.

Labour is manual effort, for which we pay wages. Labour in economics is services offered for a price. Labour can be of two types: i) Physical (physical effort) and ii) mental (thinking effort).

Capital is wealth which is invested to generate more wealth. It is the wealth used in producing further wealth. When capital is invested, yield (~~income~~ return) is expected. Capital is of two types:
i) Fixed and ii) Variable (is also called circulating capital)
↳ (land, building, machines) ↳ is the capital which changes its form (eg. raw material).

Organization is putting all the above three factors (land, labour, capital) in an organized way to make profit. Usage of resources* is organization.* to generate profit

Production Function

Technological relationship between inputs and outputs in physical terms is called as production function. Technological relationship is the relation between the input and the output.

29-03-25

It is called as positive function of production as at every stage, the value of the product increases

St-A	St-B	St-C	St-D	Final Product
10	12	15	20	30

In Tradition Equation, there are four Traditional factors of production : i) Land ii) Labour iii) Capital iv) Organization and Technology also.

Physical Inputs and Physical Outputs, i.e., functional relationship between inputs and outputs is expressed in terms of number of ~~ex~~ units.

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As Demand Function, Production Function refers to a period of time. Production Function depends on the following factors:

i) Quantities of Inputs
ii) State of Technology
iii) Size of Firm
iv) Nature of Organization (Relationship between the managers and subordinates)
v) Relative Prices of Factors of Production
vi) The Manner in which the Factors of Production are Combined
vii) The Possible Processes

Production Function is studied in two levels
i) Short Period - some factors are fixed, some factors are variable
ii) Long Period - all the factors are variable

The Equation For General Production Function:

Q - Quantity Of Produce
X - Output (after rejections after quality check)
Ld - Land
L - Labour
K - Capital
M - Management Organization
T - Technology
t - Time
f - Function

$$Q = f(X, Ld, L, K, M, T, t)$$

Production function can be expressed as a schedule, table, graphline, curve, algebraic equation and mathematical model.

The above is the traditional equation of production function.

As most of the factors of production are constant, only two factors are variable in nature. They are capital and labour. Therefore, the production function is expressed as:

Q - Quantity Of Produce
K - Capital
L - Labour
F - Function

$$Q = f(K, L)$$

The above is the modern equation of production function.

In short run period, a firm can increase production by increasing the labour. The supply of capital is fixed. Whereas, a firm can change the capital and labour in long run.

Assumptions in Production Function:

i) Technology is constant (otherwise economic laws can't be framed)
ii) All the firms used all the inputs at the maximum level of efficiency. (idle capacity is reduced)

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Break Even
- No profit, no loss

iii) Production Function is related to a time period (could be short or long).
iv) There are only two factors of production which are variable in nature - capital and labour - and all the other factors of production are constant.
v) The factors of production which are variable in nature - capital and labour - can be substituted for each other

Laws Of Production

The apply for i) Short Run ii) Long Run

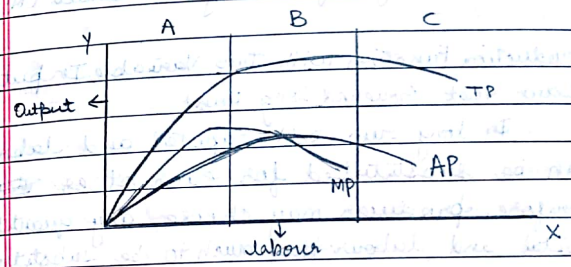
→ The Laws Of Variable Proportions / The Laws of Returns to Variable Inputs / The Laws of Returns with One Variable Input (Law that Governs Short Run)

In short run, according to the law, capital is fixed and labour is variable in nature. It has the extension arc.

According to Laws of Returns, when all the factors of production are fixed and labour is variable, the total output or total product will increase at an increasing rate and after reaching a certain point, the level of output will increase but at declining rate. More variable factors are added

Liquidity
↳ Anything that we can easily convert

to fixed input, the total output still declines. This has been proved in agriculture and manufacturing. Therefore, the laws of Returns is also known as The Laws of Diminishing Returns.



Eg. Investment in 1000 machines (fixed capital)
Test firstly with few machines, check market conditions, slowly increase machines and also the labour.

In initial stages, output increases at an increasing rate. But the capital is underutilized. In stage A, production increases at an increasing rate with every increase of the labour. But as it reaches stage C, the production increases but at declining rate. The average (AP) product; i.e., total product (TP) divided by number of labour also increases at an increasing rate, then starts declining

The marginal product (every additional product/extra unit generated with additional input) increases with average input. At one point of time, Average Product (A.P.) will be equal to Marginal Product (M.P.). Then, it starts decling before Marginal Product (M.P.)

→ Production Function with Two Variable Input (Law that Governs Long Run)

In long run both capital and labour can be substituted for each other. ~~Then~~ Therefore, producer may choose any quantity of capital and labour. How much to be substituted depends on degree of substitutability.

$$Q = f(C, L)$$

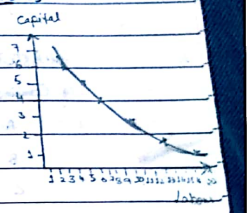
30-01-'59 Isoquants

'Iso' means equal and 'quante' means quantity. So, Isoquants stands for equal quantity. The other names are 'isoproduct curve' and 'product indifference curve'.

→

Eg.

Combinations	Capital (in lakhs)	No. of labourers
A	1	20
B	2	15
C	3	11
D	4	8
E	5	6
F	6	5



→ Whatever the combination of capital and labour is, the output is always 20000 units. The quantities throughout a given isoquant are equal. The various combination of two input factor (capital and labour) yield same level of output.

Features of isoquants:

i) It is always downward sloping.

ii) Two isoquants (of different volumes) plotted on the same graph never intersect with each other.

iii) All isoquants will be convex to the origin.

iv) They don't touch the origin.

Types of isoquants:

i) Convex isoquant

ii) Linear isoquant

iii) Right Angled isoquant

★ iv) Kinked isoquant

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* Marginal Rate of Technical Substitution (MRTS)

MRTS is rate at which one input factor is substituted with other to attain a given level of output.

Eg.

Combinations	Capital (in lakhs)	Labour	MRTS
A	1	20	5:1
B	2	15	4:1
C	3	11	3:1
D	4	8	2:1
E	5	6	1:1
F	6	5	diff. in labour : diff. in capital

Under production function with two variables, the capital and labour are being compensated with each other. When one input is being increased, it is compensated by decreasing the other with an objective of producing the same level of output.

* Isocost

Isocost is the cost at a particular level of production.

Eg. Capital = 1 lakh ÷ Rs. 20000 × 20 employees × 12 months

=

The quantity of the output will be the same but the output cost is variable.

i) Convex Isoquant

Convex isoquants are used in traditional economic theories. Here, the capital and labour are being substituted for each other at diminishing rate. It appears as smooth curve convex. (capital ↓, Employees ↑ => Salaries ↓)

ii) Linear Isoquant

In Linear Isoquants the substitutability between 'K' and 'L' will be constant.

iii) Right Angled Isoquant

In the Right Angled Isoquant, there will be a fixed amount of substitutability. (Highest & lowest are given, cannot cross them).

* iv) Kinked Isoquant

Kinked isoquant assumes limited substitutability between capital and labour. These isoquants are used by most organizations which follow the principle of isoquant (producing the same quantity).

According to the kinked isoquant, a product goes through different production processes and with every process, though there is increase in capital, you can't substitute it with the decrease in labour.

In kinked isoquants, the graph shows a kink where there is a change of labour (in every process / with every process)

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→ Production Function With All Variables Inputs

Increase in inputs proportionately leads to expansion of the scale of production. But it may not happen always. There are three technical possibilities:

i) Total Output May Increase ~~Prot~~ More than Proportionately (>1)
ii) Total Output May Increase Proportionately (=1)
iii) Total Output May Increase Less than Proportionately (<1)

→ Laws of Increasing Returns to Scale
→ Laws of Constant Returns to Scale
→ Laws of Decreasing Returns to Scale

Laws of Increasing Returns to Scale

Volume of output keeps on increasing with every increase in input and increase in output is more than increase in input.

Laws of Constant Returns to Scale

Rate of increase in output is equal to rate of increase in input.

Laws of Decrease Returns to Scale

Increase in input does not lead to proportionate increase in output.

01-02-24

→ Copp Douglas Production Function (or) Statistical Production Function

This production function is limited only to the US economies. This has been suggested by a mathamatician (Douglas) and an economist (C.W. Copp). The production function is applied at macro level. The two inputs are capital and labour. The output function is known as American Manufacturing Output. The formula used here is:

$$Q = bL^{a} C^{1-a}$$

Q → Total O/P; L → Index of Labour and Employment; C → Index of fixed capital

a, 1 - a → Elasticity of Production

It is not applicable to an individual firm as multiple firms are considered in it (macro level).

→ Economies and Diseconomies of Scale

In short run, the capital is fixed. More units you produce, less cost is involved. For example, fixed capital is Rs. 100, production is 20 units and cost per unit is Rs. 5. If production is increased to 40 units, fixed cost will be the same, that is, Rs. 100, and cost per unit will decline (will be decreased to) Rs. 2.50 per unit. For

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For any organization, the scale of production has impact on the cost of production. The advantage the firm has is called the economies of scale and the disadvantages are termed as diseconomies of scale.

Economies of Scale:

i) Internal Economies of Scale - advantages within an organization
ii) External Economies of Scale - advantages outside an organization

External Economizes:

They can also be termed as industrial advantages because they are related to all the firms in the industry

Advantages:

i) Economies of Concentration

All firms are located at one place because of the infrastructural facilities. Eg. Software park in Bangalore and Hyderabad, textile industry of Gujarat.

ii) Economies of Research and Development

~~Ad~~ The firms in the industry can pool their resources together to finance R&D activites as with R&D, more risk is associated rather than profit. The risk can be shared

iii) Economies of Welfare

Common facilities are provided by the governments when the firms are located in an industrial area. Eg. Free internet (e-zone) in software parks.

Internal Economies:

Advantages:

i) Managerial Economies
ii) Commercial Economies
iii) Financial Economies
iv) Technical Economies
v) Marketing Economies
vi) Risk Bearing Economies
vii) Economy of Larger Dimension
viii) Economies for Research and Development
ix) Invisibilities and Automated Machinery

i) Managerial Economies

As a firm expands, it needs more of qualified specialists. The advantage with the qualified specialist managers are: minimum wastage, low cost of production, new, innovative and creative products

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ii) Commercial Economies

As the scale of production has increased for an organization, the purchases and sales also increase. Transactions of buying and selling of raw materials and other supplies increases. As more supplies are bought, more discounts are given to the organization and the organization saves even on the transportation and storage costs.

iii) Financial Economies

Large organizations have large assets. With large assets, the organizations have cheap credit facilities. As political securities are more valued, the rate of interest for the loans will be reasonable.

iv) Technical Economies

Large organizations have more automated machines (machinery) as having automated machines is cheaper, compared to hiring more labour.

v) Marketing Economies

Large organizations can afford for their own distribution and marketing networks.

vi) Risk Bearing Economies

As the scale of production increases for the firms, there is also an increase in the risk. Sharing risk with the insurance companies become a priority for the firms. The coverage the large companies receive from the insurance firms is more compared to the smaller firms.

vii) Economies of Larger Dimensions

2/3 Rule - ~~Whenever~~ It has been observed that in large organizations, wherever inputs are increased by 2/3 times the production /output doubles. Tested in agriculture, manufacturing

viii) Economies for Research and Development

Large organizations like Dr. Reddy's, Hindustan Unilever, etc. - many international companies have aggreements in R and D.

ix) Invisibilities and Automated Machinery

For large organizations, when you produce seasonal goods, the labour /employees used for them are diverted to produce other products. This is not possible in smaller organizations.
(eg. AMUL - does not produce ice creams in winter, diverts the staff producing ice creams to produce some other product).

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Diseconomies:

i) Managerial Economies

Problems with specialists - as the feel that their own work is important compared to others. Ego clash

ii) Foreign Economies

Operating in foreign economies becomes difficult due to bureaucratic policies.

* Important Questions

→ How is economics useful to Engineers?
→ Define Managerial Economics and how is it useful to Engineers
→ Describe the Discounting Principle and Opportunity Cost Principle
→ Discuss the evaluation of economics.
→ What is demand? What are the determinants of demand?
→ State the Law of Demand. Discuss its exceptions and assumptions
→ What is elasticity? What are the different types of elasticity
→ What are the different methods of Demand Forecasting?
→ What is Copp Douglas Production Function?
→ What are economies and diseconomies of scale?
→ State the different Laws of Production.
→ What is isoquant? What are its features?

03-02-'18

Cost Analysis

Study of cost is called Cost Analysis. Cost means expenditure, it is different from price. A businessman or an enterpreneur, when he makes a product, he pays cost (cost is incurred), but when the consumer buys the same product, price is incurred.

In simple terms, expenditure incurred without profit is called cost, i.e., price - cost = profit / loss.

Cost is a sacrifice made. It can be monetary or non-monetary and sometimes it could be tangible or intangible. (Doctor treatment, O/P is seen, not process)

Total cost is the total cost incurred and Total revenue is the total income earned (TC and TR). TR - TC = Profit / loss

Cost Concepts

i) Fixed and Variable Cost
ii) Semi fixed or Variable Cost
iii) Explicit or Implicit Cost
iv) Marginal Cost
v) Opportunity Cost

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i) Cost which can't be changed is called fixed cost and the cost which can be changed is called variable cost. Fixed cost in the short run can be termed as variable cost in the long run.

ii) Semifixed or variable cost is the cost which is fix to some extent, beyond which they are variable.

iii) Explicit and Implicit Cost - Implicit cost is also called as imputed cost, they don't involve payment of cash but when they ~~don't involve~~ are incurred. These costs are incurred when the owner of the business is not in the position of facilities - they are also called as 'National Cost'.

Explicit (out of pocket cost) involves payment of cash (eg. rent paid for the vehicle, wages to be paid to the labour). Implicit cost (Eg. rent which is same as you have in the position of facility, rent of own premises used for business).

Estimation of explicit and implicit cost is important in decision making, as, if ignored leads to over-estimation of product.

iv) Marginal Cost - The cost of producing one additional unit is called marginal cost. Marginal cost is equal to the variable cost per unit

	FC		VC
	50	+	50
TL =	100	=	21

5

FC	VC
2.50	2.50
	2.50

v) Opportunity Cost - Breakdown of the cost

Output (a)	Total Fixed Cost (b)	Total Variable Cost (c)	Total Cost	Average Fixed Cost (b/a)	Average Variable Cost (c/a)	Average Total Cost (Average TC)	Marginal Cost
0	100	0	100	–	–	100	–
1	100	30	130	100	30	130	30
2	100	54	154	50	27	77	24
3	100	72	172	33.3	24	57.3	24
4	100	96	196	25	24	49	54
5	100	150	250	20	30	50	66
6	100	216	316	16.6	36	52.6	1.04
7	100	320	420	14.2	45.7	59.9	

Marginal Cost = diff of TFC Avg TC of sum of

Avg TC = Sum of Avg variable cost + Avg fixed cost

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Analysis of the table:

→ Total fixed cost will be fixed irrespective of inc or decrease of production activity.

→ Average fixed cost per unit - Average fixed cost p unit declines as the volume of production increas

→ As production increases, fixed cost are spread over greater number of units. Therefore, fixed co per unit will decrease. Therefore, relationship between fixed cost per unit and volume of produc will always be inverse.

→ Total variable cost will be proportionate to th production.

→ Total cost increases with the volume of produc

→ Average total cost will decrease upto a certain level of production, and then it rises agai

P.T.O. →

Cost in Long Run

In Long Run, all costs are variable as firms / organizations have more time to make changes. Changes can be of six types:

i) Production Expansion
ii) Production Upgradation
iii) Entry into new markets
iv) Initiate changes in the labour
v) Import Technology
vi) Research and Development (R and D)

All cost(s) in Long Run are variable. Short Run curve will be in U-shape. Long Run curve will be a straight line with a small curve. It will envelop many short run curves.

At a point, short run curve touches long run curve and this point is called 'optimal utilization of Organizational Resources'. All organizations strive to achieve this point

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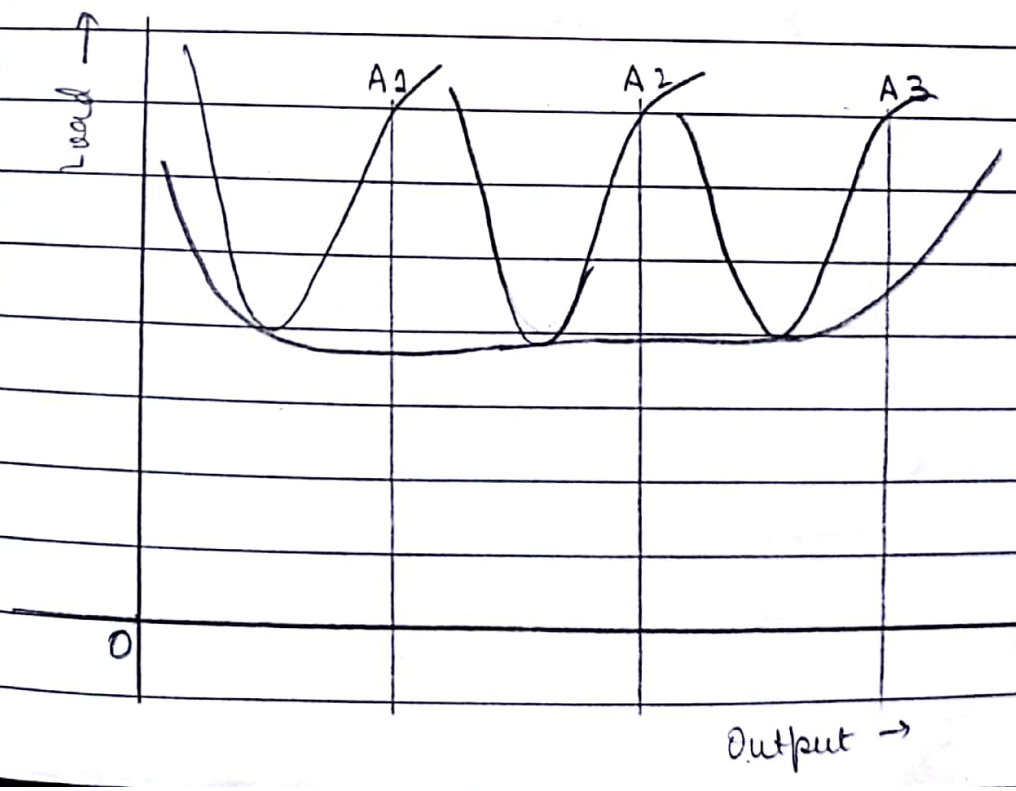
Long Run Curve

A long run curve will be a flat U-shaped curve will be enveloping many short run curves, and at a point, the short run curve intersects the long run curve.

A long run cost curve will be a flat, u shaped curve. It envelops a series of short run average cost curves. All the short run curves will be tangential to the long run cost curve. The point of tangency represents minimum average cost. The short run average curves are the operating curves and the long run average cost curve is called as planning curve.

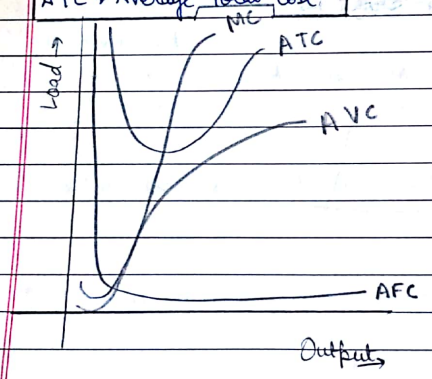
~~Cost Curves in Short Run~~



Cost Curves In Short Run

As output increases, average fixed cost (AFC) decreases. Thus, it slopes downwards. Though it appears that it touches the x-axis, it never does. The average variable cost (AVC) will fall in the beginning when the output is increasing and it rises because of the application of laws of returns. As output increases, AFC decreases. Therefore, AVC also declines. Marginal Cost will be a U-shaped curve which falls in the beginning and rises sharply later.

MC → Marginal Cost
AVC → Average Variable Cost
AFC → Average Fixed Cost
ATC → Average Total Cost



Optimum Size Of The Firm

Optimum Size of the Firm is about the optimum condition of the organization where the firm earns maximum profit per unit at minimum average cost (AVC + AFC = least) and the optimum size/condition comes into existance only in the long run, as the investment can be changed.

Break-Even Analysis

Break-Even point denotes no profit, no loss point or situation of the organization. It denotes the minimum volume of production to be undertaken to avoid losses.

As it analyzes the cost and the revenues, it is called 'The Cost Volume Profit Analysis' also (CVP analysis).

* Fixed Cost
  - The cost occurs only in short run, which are fixed in nature.
* Variable Cost
  - It is variable cost per unit. It varies with the volume of production.

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* Total Cost
  - Fixed Cost (FC) + Variable Cost (VC) = Total Cost (TC)
* Total Revenue
  - Selling Price per Unit × No of Units Sold = Total Revenue (TR)
* Contribution (Contribution Margin)
  - Amount which covers the fixed cost incurred.

  Contribution Margin = Selling Price (per unit) − Variable Cost (per unit)

  It is also determined by: Fixed Cost (per unit) + Profit (per unit)

  ⇒ Profit (per unit) = Fixed Cost (per unit) − Contribution

  C = FC + Profit ⇒ P = FC − C
* Contribution Margin Unit
  - Ratio between contribution per unit and selling price unit.
* Marginal Safety
  - It can be contributed in terms of number of units and also in terms of sales volume (money)

  Marginal Safety = Excess of Total Sales − Break Even Point

  Marginal Safety (in Rs) = Excess of Sales Volume (in Rs.) − Break Even Point (in Rs)
* Profit Volume Ratio
  - Ratio between profit volume and sales.
* ~~Break Even Point~~
  ~~Fixed Cost by Contribution Margin Per Unit~~

* Break Even Point (BEP)
  - Fixed Cost / Contribution Margin per unit

  BEP in terms of value (money) = $\frac{\text{Fixed Cost}}{\text{Contribution Margin Ratio}}$

  Contribution Margin = Selling Price − Variable Cost
* Formulae:

  SP = FC + VC + Profit

  SP − VC = FC + Profit

  SP − VC = Contribution

  Contribution per unit = SP per unit − VC per unit
* Problems:

1. A firm has fixed cost of Rs. 10000, selling price per unit is Rs. 5 Variable cost per unit is Rs. 3. Calculate Break Even Point (BEP) in terms of volume and sales. Calculate Margin of safety considering actual production as 8000 units.

→ FC = Rs. 10000 SP p/u = Rs. 5 VC p/u = Rs. 3 8000 units

Contribution Per Unit = 5 − 3 = 2

BEP (volume) = $\frac{10000}{2}$ = 5000 (Atleast 5000 units must be produced to reach BEP)

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BEP (money) = $\frac{FC}{\text{Contribution Margin Ratio}}$ = $\frac{FC}{(SP-VC)/SP}$ = $\frac{10000}{(5-3)/5}$

$\boxed{CMR = \frac{SP-VC}{SP}}$ BEP = $\frac{\cancel{10000}^{5000} \times 5}{\cancel{2}}$ = Rs.25000

[Check, BEP = No. of units BEP × SP = 5000 × 5 = 25000]

Marginal of Safety = ?

Actual Production = 8000 units

BEP (volume) = 5000 units

∴ Marginal of Safety = 8000 − 5000 = 3000 units [Excess of Sales − BEP (Sales)]

Ans: BEP (volume) = 5000 units BEP (money) = Rs.25000

Marginal Safety = 3000 units

2. A Train carries a maximum of 36,000 passengers per annum, at a fare of Rs.400. The variable cost per passenger is Rs.150 and fixed cost is Rs.25 lakhs per year. Find BEP in terms of passengers (units) and also in terms of fare collection (sales).

→ BEP (units) = $\frac{\text{Fixed Cost}}{\text{Contribution Margin p.u}}$ = $\frac{F.C}{SP-VC}$ = $\frac{2500000}{400-150}$ = $\frac{\cancel{2500000}^{10000}}{\cancel{250}}$

= 10000 passengers

BEP (money) = $\frac{\text{Fixed cost}}{\text{Contribution Margin Ratio}}$ = $\frac{2500000}{(SP-VC)/SP}$ = $\frac{2500000}{(400-150)/400}$ = $\frac{\cancel{2500000}^{10000}}{\cancel{250}}$

= 4000000

3. 'x' enterprises deals with supply of hardware parts of computers. We have the data of two years.

	Year 1 (Rs.)	Year 2 (Rs.)
Sales –	50,000	1,20,000
FC –	10,000	20,000
VC –	30,000	60,000

Determine BEP, Margin of Safety and Profit Volume Ratio.

→ BEP (Y1) = $\frac{FC}{\text{Contribution Margin p.u Ratio}}$ = $\frac{FC}{(SP-VC)/SP}$ = $\frac{10000 \cdot 50000}{50000-30000}$ = $\frac{50000}{20000}$ = $\cancel{1/2}$

= 25000

BEP (Y2) = $\frac{FC}{\text{Contribution Margin Ratio p.u}}$ = $\frac{FC}{(SP-VC)/SP}$ = $\frac{120000 \cdot 120000}{120000-60000}$ = $\frac{\cancel{120000}^{2} \cdot 20000}{\cancel{60000}}$

= 40000

Contribution (Y1) = Sales − VC = 50000 − 30000 = 20000

Contribution (Y2) = Sales − VC = 120000 − 60000 = 60000

Profit (Y1) = Contribution − FC = 20000 − 10000 = 10000

Profit (Y2) = Contribution − FC = 60000 − 20000 = 40000

P/V Ratio (Y1) = $\frac{\text{Contribution}}{\text{Sales}}$ = $\frac{20000}{50000}$ = $\frac{2}{5} \times \cancel{100}^{20}$ = = 40%

P/V Ratio (Y2) = $\frac{\text{Contribution}}{\text{Sales}}$ = $\frac{60000}{120000}$ = $\frac{1}{2} \times 100$ = 50%

Margin of Safety (Y1) = $\frac{\text{Profit}}{\text{P/V Ratio}}$ = $\frac{\cancel{10000}^{5000}}{\cancel{2/5}}$ = 5000·5 = 25000

Margin of Safety (Y2) = $\frac{\text{Profit}}{\text{P/V Ratio}}$ = $\frac{40000}{1/2}$ = 40000·2 = 80000

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* Significance of Break Even Analysis:

i) Break Even Analysis helps us in the planning of resources, finances as it helps in ascertaining the profits.

ii) To earn a desired level of profits, how much sales a firm has to make can be calculated with the help of Break Even Analysis.

iii) When a product has more than one raw material or spare product, Break Even Analysis helps us in decision making whether to make or to buy.

iv) Break Even Analysis helps with decision making when a firm deals with multi products.

v) Break Even Analysis helps us to know the efficiency level of the firm with reagard to raw material and wastage incurred.

* Limitations of Break Even Analysis

i) Break Even Analysis can be used only in short run as the costs involved in production are classified as fixed and variable costs. There is only variable cost in long run.

ii) Whenever there is semi-fixed or semi-variable cost in production, the Break Even Analysis cannot be used.

iii) Prices always change in realistic environment but we take it as constant in Break Even Analysis. So, Break Even Analysis is not realistic in nature.

→ Market [Unit-II (Continued)]

Market place or point where buyers and sellers exchange goods and services for money. Market is the basic component of economics. Based on the location of the markets, we can classify the markets as:

i) Rural ii) Urban iii) National iv) Global v) E-commerce Market

* Size of the Market

Size of the Market depends on number of buyers, income level of customers (buyers), tastes and preferences of the customers, nature of product (Necessaries/Comforts/Luxuries), state of technology, nature of demand, infrastructure.

* Market Structure

Market Structure depends on four factors:

i) Degree of Seller Concentration

- More number of sellers for a product means there is more competition.

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ii) Degree of Buyer Concentration

- More the buyers, more the sales.

[Niche Marketing - Veblen goods (goods purchased by high society of people as a mark of status) are in]

iii) Degree of product Differentiation

A product is differentiated in two types:

i) Variety ii) Brand

↳ (eg. no of inches of TV in Sony Brand) ↳ (eg. Sony, Samsung, LG, ...)

iv) Conditions of Entry into the Market

Depends on how easily the seller can enter into the market and exit from the market.

eg. Power - Supplied by Telangana Board - anybody cannot enter

Municipal Water - Difficult Entry

Bottled Water - Easy Entry

* Classification of Markets

→ Based on competition, the market can be classified into two types:

i) Perfect Competition and Perfect Market

- A market structure in which all the firms of the industry are price takers is called a perfect market. Any company enters into the market or exits from the market, the price does not change.

Features of Perfect Competition:

→ Large number of buyers and sellers: The number of buyers and sellers are so large that entry/exit of a seller does not change the market (eg. Clothes, Fruits)

→ Homogenous products and services.

→ Freedom to enter and exit the market - ~~Free to~~ without any barrier - the buyers and sellers have this freedom

→ Availability of perfect information to the buyers and the sellers. Each buyer and seller has total knowledge of the prices prevailing in the market.

→ No advertisement expenditure is incurred.

→ Perfect mobility of factors of production.

→ Each firm is a price taker ~~[illegible]~~ (have to take the price based on the market).

→ In Perfect Market,

$\boxed{\text{Price} = \text{Average Revenue (AR)} = \text{Marginal Revenue (MR)}}$

Total Revenue (TR) is revenue earned by producing and selling 'n' no. of units. TR = Price per unit × no. of units sold

=> TR = Price × Quantity = P×Q

Average Revenue = AR = Total Revenue/Quantity = P×Q/Q = P

Marginal Revenue - Profit earned on the sale of every additional item = AR (in other terms)

Thus, Price = AR = MR

Hence Proved

ii) Imperfect Competition and Imperfect Market
- Based on the number of buyers and sellers, imperfect markets can be classified as:
i) Monopoly ii) Monopolistic Competition iii) Duopoly
iv) Oligopoly v) Monopsony vi) Duopsony vii) Oligopsony
↳ Based on the number of buyers and sellers, the imperfect markets are classified as:
i) Monopoly - Single seller
ii) Monopolistic Competition - Limited sellers dividing the market among themselves
iii) Duopoly - Only two sellers
iv) Oligopoly - More number of sellers
v) Monopsony - Only one seller
vi) Duopsony - Only two sellers
vii) Oligopsony - More number of buyers
poly → seller spory → buyer
- Most of the features in perfect market are disobeyed

Monopoly
Only a single seller completely controls the entire industry. There are no substitutes for the product also. There is no difference between the firm and industry. This is an extreme version of imperfect market as a single seller completely controls the entire market.

Eg. State Electricity Board, Maruti Suzuki till 1985
→ Absolute Monopoly or Pure Monopoly
- It is controlled by a single producer and he has supply over the price. The firm has supply over goods and services on the whole. Absolute monopoly exists only as theoretical concept as any product has atleast one remote substitute.
(Eg. substitute for power - generator, batteries)
→ Limited Monopoly or Simple Monopoly
- Monopoly changes (i) when consumer demand changes, (ii) when a close substitute emerges (iii) As new firms/organizations enter (iv) When the government intervenes and changes the monopoly.
- Limited monopoly has not direct but indirect substitutes (Eg. Road travels - substitute for trains)

Reasons for existance of monopoly / Causes of monopoly
i) Strong barriers of entry and exit into / from market
ii) In some industries, competition is impractical
Eg. Water Supply, Electricity.
iii) Exclusive knowledge of technique of production

Fatures of monopoly: one firm which is one industry
no direct rivalry, not a permanent concept.

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16-02-'18

Features of Monopoly:

i) No difference between firm and industry.

ii) No rivalry since ~~there firm and~~ there is only one firm.

iii) They are price makers, not price takers

iv) There are legal, economic, technical restrictions to enter into the market

v) Monopoly is not a permanent phenomenon.

Monopolistic Competition

Features of Monopolistic Competition

i) Large number of buyers and sellers

ii) Free entry and exit into the market

iii) Perfect Factor Mobility

iv) The buyers and sellers have complete information about the market

v) Differentiated Product

In Perfect Competion / Market, the products are homogenous / identical. The difference among the products in monopolistic competition may be real or perceived.

Examples: Cameras and Televisions. Some cameras and TVs are priced highly (Eg. Sony) and others are priced low (Eg. AKAI). Though they belong to the same group, the product is differentiated.

Duopoly

There are only two sellers. Products may or may not be identical to each other. There is no aggrement between the two sellers. They are completely independent of each other. But whenever there is some decision making, they take the other's policy into consideration. It is of 2 types

i) Duopoly Without Product Differentiation

- Products are identical
- Pricing may be ~~diff~~ similar
- The organizations agree on price, quota and territory
- These collissions create the environment of Monopoly

ii) Duopoly With Product Differentiation

- Products are different
- Organizations will not be able to influence each other

Oligopoly

In Oligopoly, you have few sellers. There are two types of oligopolies:

i) Pure Oligopoly / Perfect Oligopoly

- Products are Homogenous
- Eg. Steel, Cement, Aluminium

ii) Imperfect Oligopoly

- Products are Heterogenous
- Eg. TVs, automobiles, electronics

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- Oligopoly has few sellers; the product can be homogenous or heterogenous; the market information is incomplete (not published) in nature as few sellers control it.
- there are strong restrictions to enter into the market.
- the degree of interdependence among firms is high.
- advertising and selling costs are high; as numbers of sellers are less; the market is controlled and element of monopoly exists; as there is a lot of interdependence between the firms; pricing may be increased or decreased by all at one go.

Monopsony

Only one buyer. Only ~~one~~ theoretical concept, not practical.

Duopsony

Only two buyers. Only theoretical concept, not practical.

Oligopsony

Only few buyers. Also exists in ~~the~~ practical.

Eg: Press Trust of Indian (PTI) which sells news to the newspaper agents.

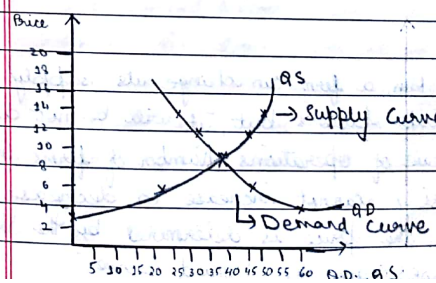
* **Price Output Determination**

Perfect Market has large number of buyers and sellers and the product is homogenous. Both buyers and suppliers are the price takers. The price is determined by market forces (demand and supply).

Market demand is demand for the industry as a whole and market supply is total quantity supplied by individual firms in the industry.

Problem:

Price Per Unit	Quantity Demanded	Quantity Supplied
15	27	54
12	30	48
9	36	36
6	45	21
3	60	0



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When the buyer and seller agree at a price and the transactions of buying and selling take place at a price, the price is stated as Equilibrium Price.

The price is not achieved at once. There is always an initial period of trial and error befor the price finally settles down and supply balances the demand.

Therefore, Equilibrium Price is determined by the demand and supply forces of the market.

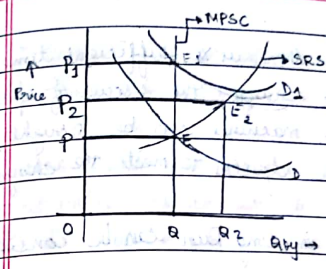
29-02-24 (LAQ)

Price Determination of Perfect Competition Market

In Price Determination in perfect competition market, supply plays an important role in long run and demand plays an important role in short run.

In Price Determination, in Short Run, importance of 'demand' is more. In Long Run, importance of supply is more.

In Short Run, a firm can change its supply with the change in variable factors, but, it will be not able to change the scale of operations. Number of firms in Short Run in the industry cannot increase or decrease. In short period of time, the price is determined by the Short Run Supply Curve (SRSC) and the Demand Curve.



In the figure, MPSC is the supply curve of the market in the short run and, in short run, the supply doesn't change, i.e., MPSC is constant.

At price 'P', 'OQ' is the quantity demanded, the price PE and EQ determine the demand 'D'.

The demand has increased from 'D' to 'D1'.

As the demand has increased, the price has also increased from P to P_1.

At E_1, the curve D1 intersects MPSC.

P_2 is the aggrement price, also known as equilibrium price, at which the quantity supplied is Q_2.

E2 is the equilibrium Price ⇒ OP_2 is the equilibrium price.

P.T.O. →

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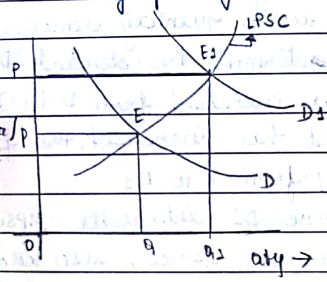
In Long Run period, there is sufficient time to build the equipment, to change the scale of operations, new firms can enter, new machines can be bought, therefore supply of firms can be adjusted to meet the changes in demand.

Price determination in Long Run can be considered under three situations:

i) Increasing Cost Industry

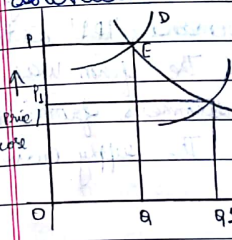
Industry operating under increasing cost conditions.



In the figure, at price 'P', quantity 'Q' is supplied and the demand curve 'D' is intersecting supply curve 'LPSC' (Long Period Supply Curve) at 'E'. The demand has increased from D to D1. The price has increased from P to P1 and people have accepted it. ~~The~~ At price P1, the quantity has increased from Q to Q1 as the sellers and manufacturers can change their factors of input because of available time and other resources (as all factors of input are variable). The new demand curve D1 is cutting the supply curve at E1. In long run, sellers have advantageous position. LPST slopes upwards in this industry. Diseconomies are more.

ii) Decreasing Cost Industry

When the firms in the industry produce additional output at a lower cost. This happens as manufacturers have more than required factors of production on hand. as they are in Long Run, they can produced the Additional output at lower cost. This is called 'Decreasing Cost Industry'. In Decreasing Cost Industry the Long Period Supply Curve (LPSC) will be moving downwards.



In the figure, at price 'P', 'Q' is produced and at 'E', the Demand Curve 'D' is intersecting LPSC. The firm has decreased the price from 'P' to 'P1' and increased the production from 'Q' to 'Q1' and is able to match the demand of the market 'D1'. 'D1' is intersecting 'LPSC' at E1. (LPSC => supply curve). In Decreasing Cost Industry, the firm can produce additional output at lesser cost and still can make profits. Any firm can increase its profits by two ways => a.) By increasing the price and b.) => By decreasing the cost. Eg. Firm 'X' is producing the products at Rs.10 per cost unit and selling at Rs.15 per unit making profit of Rs.5 per unit. Without increasing the price, the firm has reduced cost per unit to Rs.8. It increased profits from Rs.5 to Rs.7 per unit. LPST slopes down in this industry. Economies are more.

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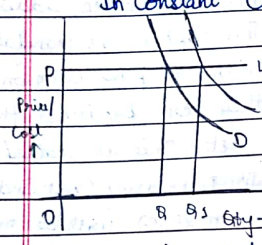
iii) Constant Cost Industry

In Constant Cost Industry, the price is constant / same.



In Constant Cost Industry, as the economies and diseconomies (are balanced) play an important role. As supply is done at the same cost though there is increase in demand, the industry is called as Constant Cost Industry. In the figure, 'D' is the initial Demand. 'D1' is the new Demand or increased demand. The firm was able to meet the demand of the customers from 'Q' to 'Q1' without changing the price/cost. The supply curve LPSC remains the same.

20-02-20

Price Output Determination In Monopoly

Price Output Determination for Monopoly is same for the firm and industry as the industry consists of only one firm.

∴ In Monopoly, Demand Curve is the Average Revenue Curve

Average Revenue = $\frac{\text{Total Revenue}}{\text{No. of units sold}}$

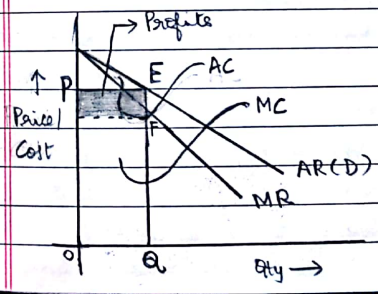
Assumptions for Price Output Determination in Monopoly

i) Single seller with many buyers.
ii) Product doesn't have any close substitutes.
iii) The firm is the price maker.
iv) Firm is industry and industry is firm.
v) Firm tries of maximize the profit.
vi) Restrictions / Barriers exist for entry and exit.

A firm monopoly can attain profits in two ways:

i) Price ↓ ⟶ Demand ↑ ⟶ Profits ↑
ii) Supply ↓ ⟶ Price ↑ ⟶ Profits ↑

A monopoly has to take two decisions to determine the price and to determine the supply of output. A monopoly can't have control over both the factors at a time, it can have control over only one of them.



In the figure, the Y-axis shows the price or cost and the X-axis shows the quantity produced. The total capacity of the firm is EQ. Average Revenue Curve (AR) is also

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the Demand Curve (D) as AR = TR / No. of units sold. AR determines the Demand. So, AR curve is taken as Demand Curve (in Short Run).

In Monopoly, the average cost per unit will be continuously increasing which makes AR curve slope downwards, i.e. AR continuously declines. Marginal Revenue (MR), which is defined as additional revenue earned on one additional unit or every one extra unit sold in the market.

The point where AC intersects EQ is the Break Even Point, i.e., F in the figure. FQ is Margin Of Safety. As MC is constanly increasing, it reduces MR.

26-02-'18

UNIT-IV : ACCOUNTANCY

Any business organization aims for profit maximization and profit maximization is derived from customer satisfaction. Business is a human activity directed at making profits or with an objective of making profits. Business is of two types: i) Manufacturing and ii) Trading. Business will have transactions of two types: i) Cash and ii) Credit.

Accounting Cycle

At regular intervals, i.e., at the end of every year, P and L (Profit and Loss) Accounts and Balance Sheets are prepared.

Accounting Cycle is a complete sequence of recording the transactions to preparation of financial statements (P and L Accounts and Balance Sheets).

Steps in Accounting Cycle:

i) Journalizing
- Identifying debit and credit aspects of each transaction and recording them in journals.

ii) Ledger Posting
- Transfer of transaction from journal to their respective accounts opened in ledger.

iii) Balancing
- Ascertaining the difference between the total of debit and credit column of a ledger account.

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iv) Trial Balance

- Summary of ledger accounts. It involves preparation of list showing the balances of each and every account to verify whether sum of debit is equal to sum of credit.

v) Trading and P&L Account

- These statements are prepared to assetain profit and loss for the financial year (1st April - 31

vi) Balance Sheet

- A balance sheet is prepared to assetain the financial position of the overall business.

Objectives of Accounting:

i) To maintain the records.
ii) To assetain results of the business operations.
iii) To assetain financial status of the business.
iv) To generate and communicate information to the use

Functions of Accounting:

i) Recording
ii) Classifying
iii) Summarizing
iv) Analyzing
v) Interpretation
vi) Communicating

NOTE:

Types of Accounts:

1.) Personal Accounts
   (a) Natural Person (Ganesh Account, Raju Account)
   (b) Artificial Person Account (XYZ company Account, Ram and company Account)
   (c) Representative account (CBIT)

2.) Real Accounts
   - They are related to both tangible and intangible accounts.
   - Tangible = buildings, machinery.
   - Intangible = Copyright, patent

3.) Nominal Accounts
   - Nominal accounts are related to expenses, losses, depreciation, income and gains, increase in the value of assets, etc..

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Types of Accounting:
i) Financial Accounting
ii) Cost Accounting (controlling the cost to maximize profits)
iii) Management Accounting

Classification of Accounts:
- In Accountancy, there are two types of accounts:
i) Personal and ii) Impersonal (a.) Real and b.) Nominal)
- In double entry system, the accounts are of the above types
i) Personal Accounts - They are related to people, i.e., natural persons.
ii) Impersonal Accounts
- Artificial persons and representative persons also have real accounts.
- Real accounts are for the tangible and intangible accounts.
Tangibel accounts - we can feel and see - buildings, furniture
Intangible accounts - goodwill / reputation - copyright
- Nominal Accounts
Nominal accounts are related to expenses, losses, depreciation, income and gains, increase in the value of assets, etc..

Example of Double Entry System: X is a trader who purchased a machine worth Rs 80,000. In his book of accounts, he will make an entry in the following way: Machine is Debit (Coming in)
Rs 80000 is Credit (Going out)

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27-02-18

Journal Entries

1. From the following transactions of Mr. Ganesh, find out:
   i) Nature of Accounts
   ii) What is debit and what is credit
   iii) Give also journal entries

Sl.No.	Date	Transaction
1.	Jan 1st 2018	Ganesh started business with Rs.20000
2.	Jan 2nd 2018	Purchased furniture for Rs. 1,000
3.	Jan 5th 2018	Purchased goods on credit from Mohan for Rs.800
4.	Jan 6th 2018	Borrowed Rs.2000 from Raju
5.	Jan 7th 2018	Sold goods to Rajesh on credit for Rs. 2500

→

SR. No.	Date	Account	Nature of Account	Debit (or) Credit
1	Jan 1st '18	Cash a/c	Real a/c	Debit
		Ganesh a/c	Personal a/c	Credit
2	Jan 2nd '18	Furniture a/c	Real a/c	Debit
		Cash a/c	Real a/c	Credit
3	Jan 5th '18	Purchase a/c	Nominal a/c	Debit
		Cash a/c	Real a/c	Credit
4	Jan 6th '18	Cash a/c	Real a/c	Debit
		Raju a/c	Personal a/c	Credit
5	Jan 7th '18	Sales a/c	Nominal a/c	Credit
		Rajesh a/c	Personal a/c	Debit

Journal Entries in the books of Mr. Ganesh:

Date	Journal Entries	L F No.	Debit	Credit
Jan 1st '18	Cash a/c Dr		20,000	
	To Ganesh a/c			20,000
	(Started business with Rs.20,000)			
Jan 2nd '18	Furniture a/c Dr		1000	
	To Cash a/c			1,000
	(Purchased furniture for Rs.1000)			
Jan 5th '18	Purchase a/c Dr		800	
	To Mohan a/c			800
	(Purchased goods on credit for Rs.800)			
Jan 6th '18	Cash a/c Dr		2,000	
	To loan from Raju a/c			2,000
	(Took a loan of Rs.2000 from Raju)			
Jan 7th '18	Rajesh a/c Dr		2,500	
	To Sales a/c			2,500
	(Goods sold on credit)			

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Rules of different accounts

* **Personal Account:**

  Debit = Received

  Credit = Given

* **Real Account:**

  Debit = Comes In

  Credit = Goes out

* **Nominal Account:**

  Debit = All expenses and losses

  Credit = All incomes and gains

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