

# \* Linear Programming

→ Linear programming is a mathematical programming technique to optimize performance

(e.g. profit or cost)

under a set of resource constraints (e.g. machine-hours, man-hours, money, materials etc.)

as specified by an organization

→ Linear programming is a technique for determining an optimum schedule of interdependent activities, in view of available resources.

→ Programming is just another word for planning and refers to the process of determining a particular plan of action from amongst several alternatives.

→ The word Linear stands for indicating all relationships involved in a particular problem are linear ( $<$ ,  $>$ ,  $=$ ).



# \* Concept of Linear Programming Model :-

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→ Linear programming deals with the optimization (minimization or maximization) of a function of variables known as objective function.

subject to the set of linear equations and/or inequalities known as Constraints.

→ The objective fun may be profit, cost, production capacity or any other measure of effectiveness which is to be obtained in the best possible or optimal manner.

→ The constraints may be imposed by different resources such as market demand, production process & equipment, storage capacity, raw material availability etc.



# ✓ \* Linear programming Problem:-

A linear programming problem (LPP) consists of 3 components.

(i) Decision variables (activities)

(ii) The objective (goal)

(iii) The constraints (restrictions)

(i) The Decision variables:-

\* It refers activities that are competing one another for sharing the resources available.

\* It is considered as continuous, non-negative and controllable.

(ii) The objective :-

\* L.P.P. must have objective

\* It should be clearly identifiable & measurable in quantitative term.

\* It could be of profit (sales) maximization, cost (time) minimization & so on.



\* The relationship among the variable representing objective must be Linear.

eg:- maximize or minimize  $Z = C_1X_1 + C_2X_2 + C_3X_3 + \dots + C_nX_n$

### iii) The Constraints

There are always certain limitations (on constraints)

on the use of resources such as

Labour, space, raw material, money etc. that limit the

degree to which an objective can be achieved.

eg:-