Frequently Asked Questions

1. What is Linear Programming?

Answer:

Linear programming is the general technique of optimum allocation of 'scarce' or 'limited' resources, such as labour, material, machine ,capital, energy, etc. to several competing activities, such as products, services, jobs, new equipment's, projects etc. on the basis of a given criterion of optimality.

2. What does the term 'limited' mean?

Answer:

The term 'limited' here is used to describe availability of scarce resources during planning period.

3. What does the criterion of optimality mean?

Answer:

The criterion of optimality generally is either performance, return on investment, utility, time distance, etc.

4. What does the term linear mean?

Answer:

The word linear is used to describe the proportionate relationship of two or more variables in a model. Thus a given change in one variable will always cause a resulting proportional change in another variable.

5. What does the term programing mean?

Answer:

The word programming here is used to specify a sort of planning that involves the economic allocation of limited resources by adopting a particular course of action or strategy amongst various alternative strategies to achieve the desired objective.

6. How is an optimal selection done?

Answer:

A course of action is said to be most desirable or optimal if it optimizes (maximizes or minimizes) some measure of criterion of optimally such as profit, cost, rate of return, time, distance, utility, etc.

7. What are the three components of a structure linear programming? **Answer:**

The three components of a structure linear programming are

- > The activities and their relationship,
- > The objective
- The constrains.
- 8. What do we understand by the term constraints?

Answer:

There are always certain limitations (or constraints) on the use of limited resources, e.g. labour, machine, raw material, space, money, etc. such constraints must be expressed as linear equalities or inequalities in terms of decision variables.

9. What are the assumptions in linear programming?

Answer:

The basic assumptions of the linear programming are certainty, divisibility, additivity and linearity.

10. What does the assumption of certainty mean?

Answer:

In all Linear programming model it is assumed that all model parameters such as availability of resources, profit contribution of a unit of decision variable and resource consumption by a unit of decision variable must be known and constant.

11. What is the assumption of linearity express?

Answer:

All relationships in the Linear Programming model are linear. This is applicable in both objective function and in case of constraints. Ideally in Linear programming given a decision variable, the amount of particular resource (i) and its contribution to the cost in objective function must be directly proportional to its amount (i).

12. What are the different steps involved in the formulation of linear programming model? **Answer:**

The various steps involved in the formulation of linear programming model are

- Define decision variable
- Formulate the constrains
- Formulate the objective function
- 13. What is done while define the decision variables?

Answer:

- a) Express each constraint in words and check whether the constraint is of the form (≥ atleast as large as), (≤ no longer than) or (= exactly equal to)
- b) Express the objective function in words
- c) Verbally identify the decision variables
- 14. How is the constrains formulated?

Answer:

Constraints are formulated by taking into consideration the resource availability and express them as linear equality or inequality in terms of the decision variables.

15. What are the benefits of formulating the constrain?

Answer:

These constraints define the range within which values of decision variables can lie. Wrong formulation can lead to either solutions which are not feasible or excluding some solution which are really feasible and possibly optimal.