# Frequently Asked Questions

1. How is an optimal solution chosen?
   **Answer:**
   An optimal as well as feasible solution to an linear programming problem is obtained by choosing among several values of decision variables $x_1$, $x_2$, ….,$x_n$ the one set of values that satisfy the given set of constraints simultaneously and also provide the optimal ( maximum or minimum) value of the given objective function.

2. What is the technique used to identify the optimal solution?
   **Answer**:
   The technique used to identify the optimal solution is called the graphical solution technique for a linear programming problem with two variables.

3. Mention the two graphical approaches to find the optimal solution?
   **Answer:**
   The two graphical solution techniques or approaches to find the optimal solution are:
   - Extreme point enumeration approach
   - Iso-profit (cost) function approach

4. What do you understand by the term ‘feasible solution’?
   **Answer:**
   The solution values of decision variables $x_j$ (j = 1, 2, …..n) which satisfy the constraints and non- negativity conditions of a general linear programming model are said to constitute the feasible solution.

5. How do we define basic solution?
   **Answer:**
   For a set of ‘m’ equation in ‘n’ variables (n greater than m), a solution obtained by setting (n-m) variables equal to zero and solving for remaining ‘m’ equations in ‘m’ variables is called a basic solution.

6. What are the types of basic feasible solution?
   **Answer:**
   There are two types of basic feasible solution degenerate and non-degenerate solutions.

7. What does degenerate mean?
   **Answer:**
   Degenerate is a basic feasible solution and it is called degenerate if at least one basic variable possess zero value.

8. What does non degenerate mean?
   **Answer:**
   Non-degenerate is a basic feasible solution and it is called non- degenerate if all ‘m’ basic variables are non-zero and positive.

9. What does the word unbound solution mean?
   **Answer:**

**Unbounded solution:** A solution which can be increased or decreased the value of objective function of linear programming problem indefinitely is called unbound solution.

**10.** What is a convex set?

**Answer:**

A convex set is a polygon and by 'convex' we mean that if any two points of the polygon are selected arbitrarily, then a straight line segment joining the two points lies completely within the polygon.

**11.** What is an extreme point method?

**Answer:**

An extreme point method identifies coordinates of each of the extreme (or corner) points of the feasible region by either drawing perpendiculars on the x-axis and the y-axis or by solving two intersecting equations.

**12.** How iso-profit (cost) is method used?

**Answer:**

Iso-profit (cost) determines the slope (x1, x2) of the objective function and then joins intercepts to reveal the profit (or cost) line.

**13.** What is the slope of the objective function?

**Answer:**

The slope of the objective function is same as that of the constraint forming the boundary of the feasible solutions region.

**14.** When is a constraint said to be active?

**Answer:**

The constraint is said to be active or binding or tight, if at optimally, the left hand side of a constraint is equal to the right hand side. In other words, an equal constraint is always active. An inequality constraint may or may not be active.

**15.** What do we mean by infeasible solution?

**Answer:**

If it is not possible to find a feasible solution that satisfies all the constraints, then the linear programming problem is said to have an infeasible solution or alternatively, inconsistence. Infeasibility depends solely on the constraints and has nothing to do with the objective function.