

# **7. OPERATION RESEARCH**

**OPERATION RESEARCH:** It's given by George B. Dantzig. Its study used for solving optimization problems.

## **TYPES OF SOLUTIONS:**

### **1. Unique Solution:**

Only one corner point has the best objective value.

### **2. Alternative optimal Solution:**

A situation when more than one optimal solution is possible.

#### **NOTE:**

#### **BINDING CONSTRAIN:**

When we put the value of optimal solution in the constrain and if  $LHS=RHS$ , the constraint is termed as binding constraint equation.

- If the slope of binding constraint equation is equal to the slope of the objective equation, then it will be called as multiple solution.

#### **REDUNDANT CONSTRAIN EQUATION:**

constraint which doesn't become part of boundary making feasible region is called as redundant constraint.

Inclusion or exclusion of such equation doesn't have any effect on the final solution.

**3. Unbounded solution:** If we couldn't able to find the extreme corner point then it's called unbounded solution.

**4. Infeasible Solution:** If there is no common feasible region then it's called as no solution.

## **LOW OR RULES IN LINEAR PROGRAMMING PROBLEM (LPP):**

- **LAW OF CERTAINTY:** In LP model, the various parameter like objective function coefficient, constraint and resources are known exactly and their values don't change.
- **LAW OF PROPORTIONALITY:** There exist proportionality relationship between objective & constraint.
- **LAW OF ADDITION:** Total Resources are equal to the sum of the resources used by individual activities.
- **DIVERSITY:** Solution doesn't need to be a whole number.