**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.

1. **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. |

1. **Unbounded solution:** If we couldn’t able to find the extreme corner point then it’s called unbounded solution.
2. **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.