

### Recommended books

- Kanti Swaroop
- Kapoor
- Ghosh & Chakraborty

### Operation research

The subject OR is a branch of applied mathematics used to provide a scientific base for management to take timely and effective decisions to their problems.

- \* As a manager operates his system in an environment, which never remains static while taking his decisions he has to consider all aspects like human, economic and political, so that his solution is optimal.
- \* In present environment, a manager has to deal with systems with complex inter-relationship of various factors among them as well as equally complicated dependence of the criterion of effective performance of the system on these factors.
- \* Though the common sense, experience and commitment of the manager is essential, the role of scientific methods in making optimal decisions is also important.
- \* OR uses logical analysis and analytical techniques to study the behaviour of a system in relation to its overall working resulting from its functionally interconnected constraints whose parameters are recognized, quantified and their relationships are identified to the extent possible and alternative decisions are derived.
- \* In the industrial world, the most important problems, for which these techniques are used is "how to maximize the profit" and "how to minimize the cost".

**Decision** - It is the conclusion of a process designed to weigh the relative use or utilities of a set of alternatives in hand so that the decision maker selects the best alternative based on his situation.



- \* The process of decision making has two phases -
  1. Formulation of goals and objectives, enumeration of environmental constraints, identification and evaluation of alternatives.
  2. Selection of optimal course of action for a given set of constraints.

- \* In OR, we are concerned with "how to choose an optimal strategy under specified set of assumptions including all available strategies and their associated pay-offs."

The definition of OR as per the "OR society of Great Britain":  
OR is the application of the methods of science to complex problems arising in the direction and management of large systems of men, material and money in industry, business, government and defense.

- \* The distinctive approach is to develop a scientific model of the system, incorporating measurements of factors such as chance and risk with which to predict and compare the outcome of alternative decisions, strategies or controls.
- \* The purpose is to help management to determine its policy and actions scientifically.