→ Applications of Optimization Techniques in Engineering:

Optimization Techniques are applied to solve almost every type of engineering problem. Some of typical applications from different engineering disciplines are

→ (I) General:

① Optimal production planning, controlling and scheduling.

② Inventory control.

③ Optimum design of control systems

④ Shortest route taken by a salesperson visiting various cities during one tour.

⑤ Optimum design of electrical machinery such as motors, generators and transformers.

⑥ Optimum design of electrical networks.

⑦ Optimum design of chemical processing equipment and plants.

⑧ Design of optimum pipeline network for process industries.

⑨ Optimum design of linkages, cams, gears, machine tools, and other machanical components.

⑩ Design of civil engineering Strutures such as fames, foundations, bridges, towers, chimneys and dams for minimum cost.

⑪ Analysis of statistical data and building empirical models from experimental result to obtain the most accurate representation of the physical phenomenon.

⑫ finding the optimal trajectories of space vehicles.

⑬ Optimal plastic design of structures.

→ II. Maximization:

① Allocation of resources or services among several activities to maximize the benefit.

② Planning the best strategy to obtain maximum profit in the presence of a competitor.

③ Design of water resources system for maximum benefit.

④ Designing of pumps, turbines and heat transfer equipment for maximum efficiency.

→ III. Minimization:

① planning of maintenance and replacement of equipment to reduce operating costs.

② Controlling the waiting and idle times and queueing in production lines to reduce the costs.

③ Design of aircraft and aerospace structures for minimum weight.

④ Minimum weight design of structures for earthquake, wind and other types of random loading.

⑤ Selection of machining conditions in metal-cutting processes for minimum production cost.

⑥ Design of material handling equipment such as conveyors, trucks and cranes for minimum cost.

→ IV Management:

① Deciding the location and site of an industry.

② Planning the best strategy in a competitive market and devising ways of increasing the earnings of the company.

③ Finding the shortest route which a salesman ~~should~~ should adopt so as to minimize the cost and time spent in visiting a number of cities.

④ Inventory control to know when to purchase, how much to purchase to meet the future demands which will arise.

⑤ Queuing system to device methods so as to reduce the idle time of the customers, the service and the machines.

⑥ In forecasting the precautions to be taken in the designing of very high many storied buildings with regard to their capacity to face natural calamities such as, fast winds, storms, earthquakes etc.

⑦ In the probability and statistical fields.

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V. Computer engineering field:

① All computers of a big organisation are now a days inter connected, the knowledge of job sequencing help in solving the problem of inter connections.

② Preparing software is an important job of computer engineers. They prepare algorithms of all important problems soluble by various O.R. methods.

③ In preparing websites, the knowledge of sequencing and scheduling is very essential.

④ In information technology which is part of computer engineering, the queuing network have vast applications.

⑤ The renewal model of program behavior is dealt by stochastic processes.

⑥ The probabity and statistics theory and queuing theory are important in computer performance evaluations.

⑦ Modeling and analysis is of great use in CSE.

⑧ The art of computer programming has applications in design and analysis of algorithms.

⑨ Fault tolerance, diagnosic and reliability design of digital systems has vast applications in computer engineering.

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