1 .What is an operation research?

Operations Research (OR), an analytical method of decision making, solves management problems by breaking down the problem into elementary components, and solve them in well-defined steps using mathematical analysis.

2.What is payoff matrix?

A payoff matrix specifies the probable value of different alternatives, depending on different possible outcomes associated with each.

3. What is assignment problem?

An assignment problem is a particular case of transportation problem. The objective is to assign a number of resources to an equal number of activities . So as to minimize total cost or maximize total profit of allocation.

4. Write the concept of duality?

As hinted at by the word "dual" within it, duality refers to having two parts, often with opposite meanings, like the duality of good and evil. If there are two sides to a coin, metaphorically speaking, there's a duality.

5. What is simplex method?

Simplex method is an approach to solving linear programming models by hand using slack variables, tableaus, and pivot variables as a means to finding the optimal solution of an optimization problem. Simplex tableau is used to perform row operations on the linear programming model as well as for checking optimality.

6. What is primal problem?

In general given two dual pairs of separated locally convex spaces and and the function , we can define the primal problem as finding such that. In other words, if exists, is the minimum of the function. and the infimum (greatest lower bound) of the function is attained.

7. Short note on game theory.

In environmental and natural resource management, Game Theory is a helpful tool to analyze e.g., international environmental problems, situations when international environmental treaties are decided, or competition over exhaustible natural resources.

8. Write the expansion of PERT.

The program evaluation and review technique (PERT) is a statistical tool used in project management, which was designed to analyze and represent the tasks involved in completing a given project.

9. Define optimum?

Optimum utilization of resources is a concept in Economics and Management and can be applied in businesses. Management principles are helpful in the optimum utilization of resources. Optimum Utilization of resources means using the resources available at hand and making best use of them.

10. What is CPM?

The critical path method (CPM) is a technique where you identify tasks that are necessary for project completion and determine scheduling flexibilities. A critical path in project management is the longest sequence of activities that must be finished on time in order for the entire project to be complete

11. Name any two uses of replacement model?

The replacement situations may be placed into the following two main categories : (1) Replacement of capital equipment that deteriorates with time, e.g., machine tools, buses in transport organization, planes, etc. (2) Individual or group replacement of items that fail completely, e.g., light bulbs, tubes, etc.

12. What is graphical method?

Graphical method to solve Linear Programming problem (LPP) helps to visualize the procedure explicitly. It also helps to understand the different terminologies associated with the solution of LPP. Linear programming problems with two variables can be represented and solved graphically with ease.

13. What are the necessity of O.R.?

The resources you need to start a business can be broken into five broad categories: financial, human, educational, emotional and physical resources.

- Financial Resources: Funding. ...
- Human Resources: Employees. ...
- Educational Resources: Industry Know How. ...
- Physical Resources: Premises and Equipment.

14. List out any two applications of O.R.

Organizations use the following resource management techniques to maximize resource efficiency, often relying on software to provide transparency to help leaders make smarter resource decisions.

- Resource Allocation. ...
- Resource Utilization. ...
- Resource Leveling. ...
- Resource Forecasting.

15. What is Travelling Salesman problem?

The traveling salesman problem (TSP) is an algorithmic problem tasked with finding the shortest route between a set of points and locations that must be visited. In the problem statement, the points are the cities a salesperson might visit

16.Write the expansion of CPM?

The critical path method (CPM) is a technique where you identify tasks that are necessary for project completion and determine scheduling flexibilities. A critical path in project management is the longest sequence of activities that must be finished on time in order for the entire project to be complete

17. What is Linear programming?

Linear programming is a mathematical technique that determines the best way to use available resources. Managers use the process to help make decisions about the most efficient use of limited resources – like money, time, materials, and machinery.

18. What is Simulation?

A simulation is a model that mimics the operation of an existing or proposed system, providing evidence for decision-making by being able to test different scenarios or process changes. This can be coupled with virtual reality technologies for a more immersive experience.

19. What are the two important forms of Primal-dual pairs?

1. Symmetric: Here all constraints of both primal and dual problems are in equations and variables are non negative.

2. Un-Symmetric: Here all constraints of primal are equations and primal variables are non negative.

20. What are the advantages of CPM?

Advantages of Critical Path Method. The critical path method is a reliable way for project managers to budget time and allocate resources. Advantages of CPM include improved accuracy and flexibility in scheduling, clearer communication between project managers and stakeholders, easier task prioritization

21. What is Computer simulation?

computer simulation, the use of a computer to represent the dynamic responses of one system by the behaviour of another system modeled after it. A simulation uses a mathematical description, or model, of a real system in the form of a computer program.

22. What is Sequencing model?

Sequencing can be defined as the selection of an order for a series of jobs to be done on a number of service facilities (machine). In sequencing, a systematic procedure is adopted in assigning priorities to waiting jobs thereby determining the sequence in which jobs will be processed.

23. What are the examples of Assignment Model.?

What are Assignment Models? Assignment models are used to estimate the traffic flows on a network. Traffic Assignment Models estimate the flow on a street or highway network using an input matrix of flows that indicate the volume of traffic between origin and destination (O-D) pairs

24. What is Idle time on machines?

Idle time is a period of time in which an asset (machine or an employee) is ready and available, but is not doing anything productive. This is why idle time is sometimes referred to as waiting time. Idle time is when a machine is waiting for input material.

25. What are two limitations of an OR model?

Limitations of Operations Research

- (i) Magnitude of Computation.
- (ii) Non-Quantifiable Factors.
- (iii) Distance between User and Analyst.
- (iv)Time and Money Costs.
- (v) Implementation.

26. Define zero-sum game?

What Is a Zero-Sum Game? Zero-sum is a situation, often cited in game theory, in which one person's gain is equivalent to another's loss, so the net change in wealth or benefit is zero. A zero-sum game may have as few as two players or as many as millions of participants.

27. What is sequencing problem?

Sequencing problems are concerned with an appropriate order (sequence) for a series of jobs to be done on a finite number of service facilities (like machines) in some well-defined technological order so as to optimize some efficiency measure such as total elapsed time or overall cost etc.

28. Write any two characteristics of standard form of LPP?

The standard form of linear programming problem:

- The standard form of linear programming is. ...
- The characteristics of a standard linear program are: 1) Maximization of a program, 2) Equality constraints and 3) non-negative variables.

29. What is Game theory?

Game theory is a branch of applied mathematics that provides tools for analyzing situations in which parties (called players) make decisions that are interdependent. This interdependence causes each player to consider the other player's possible decisions(or strategies) in formulating strategy.

30. What is salesman problem?

The travelling salesman problem (also called the travelling salesperson problem or TSP) asks the following question: "Given a list of cities and the distances between each pair of cities, what is the shortest possible route that visits each city exactly once and returns to the origin city

31. What is PERT?

A program evaluation review technique (PERT) chart is a graphical representation of a project's timeline that displays all of the individual tasks necessary to complete the project. As a project management tool, the PERT chart is often preferred to the Gantt chart because it identifies task dependencies.

32. What are the transportation models?

The transportation model addresses the concept of moving a thing from one place to another without change. It assumes that any damage en route has negative consequences, and so it's used to analyze transportation systems and find the most efficient route for resource allocation

33. What is Monte Carlo method?

Monte Carlo Simulation is a mathematical method for calculating the odds of multiple possible outcomes occurring in an uncertain process through repeated random sampling. This computational algorithm makes assessing risks associated with a particular process convenient, thereby enabling better decision-making

34. What are the objectives of Operation Research?

The central objective of operations research is optimization, i.e., "to do things best under the given circumstances." This general concept has great many applications, for instance, in agricultural planning, biotechnology, data analysis, distribution of goods and resources, emergency and rescue operations, engineering

35. What is the test of optimality in the simplex method?

In the standard Simplex method, the optimality test is based on a reading of the coefficients of the nonbasic variables in the zeroth row of the Simplex tableau; that is, it is based on a reading of the reduced costs.

36. What is Feasible solution?

A feasible solution is a set of values for the decision variables that satisfies all of the constraints in an optimization problem. The set of all feasible solutions defines the feasible region of the problem.

37. What is Duality problem?

The dual problem is an LP defined directly and systematically from the primal (or original) LP model. The two problems are so closely related that the optimal solution of one problem automatically provides the optimal solution to the other

38. What is Transportation problem?

The transportation problem is a special type of linear programming problem where the objetive consists in minimizing transportation cost of a given commodity from a number of sources or origins (e.g. factory, manufacturing facility) to a number of destinations (e.g. warehouse, store)

39. What is Assignment problem?

assignment problem apparent problem is assigning each talk to a person that the processing time is given we should make sure that only one job is assigned to a person

40. What is variation of Assignment problem?

The assignment problem is classified into balanced assignment problem and unbalanced assignment problem. If the number of rows is equal to the number of columns, then the problem is termed as a balanced assignment problem; otherwise, an unbalanced assignment problem.

41. What is Monate Carlo method?

Monte Carlo Simulation is a mathematical method for calculating the odds of multiple possible outcomes occurring in an uncertain process through repeated random sampling. This computational algorithm makes assessing risks associated with a particular process convenient, thereby enabling better decision-making

42. What is sequencing problem?

Sequencing problems are concerned with an appropriate order (sequence) for a series of jobs to be done on a finite number of service facilities (like machines) in some well-defined technological order so as to optimize some efficiency measure such as total elapsed time or overall cost etc.

43. Define simulation?

Simulation techniques consist in sampling the input and characterizing the uncertainty of the corresponding output. This is notably the case of the crude Monte Carlo method that is well suited to characterize events whose associated probabilities are not too low with respect to the simulation budget.