1. What mathematical technique is commonly used to formulate linear systems?

a) Differential Equations

b) Partial Differential Equations

c) Linear Programming (LP)

d) Nonlinear Optimization

Answer: c) Linear Programming (LP)

Explanation: Linear programming is a mathematical technique used to optimize a linear objective function subject to linear equality and inequality constraints. It's commonly employed to model various real-world optimization problems.

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2. Which method is used to solve linear programming problems involving two variables?

a) Simplex Method

b) Gradient Descent

c) Euler's Method

d) Lagrange Multipliers

Answer: a) Simplex Method

Explanation: The Simplex Method is a widely used algorithm for solving linear programming problems involving two or more variables. It iteratively moves from one feasible solution to another until an optimal solution is reached.

3. Which special case of linear programming deals with the optimal allocation of resources from multiple sources to multiple destinations?

a) Transportation Model
b) Assignment Model
c) Production Model
d) Inventory Model

Answer: a) Transportation Model

Explanation: The Transportation Model deals with optimizing the allocation of goods from multiple origins to multiple destinations while minimizing transportation costs or maximizing profit.

4. Which method is utilized to find an initial feasible solution in the Transportation Model?

a) Vogel's Approximation Method (VAM)
b) Newton's Method
c) Gauss-Seidel Method
d) Simpson's Rule

Answer: a) Vogel's Approximation Method (VAM)

Explanation: Vogel's Approximation Method is commonly used to find an initial feasible solution in the Transportation Model by identifying the most balanced transportation cost for each row and column.

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5. What term describes the situation when the solution of a linear programming problem has more than one optimal solution?

a) Duality
b) Degeneracy
c) Sensitivity Analysis
d) Feasibility

Answer: b) Degeneracy

Explanation: Degeneracy occurs in linear programming when the solution space has more than one optimal solution, often leading to cycling behavior in simplex-based algorithms.

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6. What software packages are commonly used for solving linear programming problems?

a) SW Lindo, Tora, Excell
b) MATLAB, Python, R
c) AutoCAD, SolidWorks, CATIA

d) Adobe Photoshop, Illustrator, InDesign

Answer: a) SW Lindo, Tora, Excell

Explanation: SW Lindo, Tora, and Excell are commonly used software packages for solving linear programming problems, offering user-friendly interfaces and powerful optimization algorithms.

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7. In linear programming, what does the term "penalty method" refer to?

a) A method to penalize constraints violating feasibility
b) A method to penalize the objective function for not being linear
c) A method to penalize deviations from the optimal solution
d) A method to penalize the use of non-integer values in the solution

Answer: a) A method to penalize constraints violating feasibility

Explanation: The penalty method in linear programming refers to a technique where constraints violating feasibility are penalized in the objective function, encouraging the algorithm to prioritize feasible solutions.

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8. What method is commonly used to overcome degeneracy in linear programming

problems?

a) Vogel's Approximation Method (VAM)
b) Penalty Method
c) Sensitivity Analysis
d) Dantzig's Rule

Answer: d) Dantzig's Rule

Explanation: Dantzig's Rule, also known as the minimum ratio rule, is commonly used in linear programming to overcome degeneracy by selecting the entering variable based on the smallest ratio of the right-hand side to the coefficient in the objective function.

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9. Which graphical method is used to solve special cases of linear programming problems involving two variables?

a) Voronoi Diagram
b) Convex Hull
c) Vogel's Approximation Method (VAM)
d) Iso-profit Line Method

Answer: d) Iso-profit Line Method

Explanation: The Iso-profit Line Method involves plotting iso-profit lines on a graph to identify the optimal solution for special cases of linear programming problems involving two

variables.

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10. What term describes the situation when there are not enough resources available to satisfy all demands in the Transportation Model?

a) Degeneracy
b) Infeasibility
c) Feasibility
d) Surplus

Answer: b) Infeasibility

Explanation: Infeasibility occurs in the Transportation Model when there are not enough resources available to satisfy all demands, making it impossible to find a feasible solution.

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