1. Which of the following is NOT a type of constraint used in linear programming?

* Equality constraints
* Inequality constraint
* Quadratic constraints
* Binary constraints

2. In the context of optimization, what does a feasibility region represent?

* The set of all optimal solutions
* The region where the objective function is maximized
* The region where all constraints are satisfied
* The boundary where hard constraints are violated

3. How can the barrier method be best described in the context of optimization?

* It integrates constraints into the objective function with penalties.
* It forms a boundary that solutions cannot cross.
* It converts soft constraints to hard constraints.
* It transforms non-linear constraints into linear constraints.

4. What kind of optimization problems usually involve budget constraints?

* Image processing
* Portfolio selection
* Text classification
* Weather forecasting

5. Which approach allows for the direct solution of non-linear optimization problems in Excel?

* Simplex LP method
* GRG Nonlinear
* Evolutionary method
* Dual Simplex

6. How does the 'Big M' method assist in solving linear programming problems?

* It simplifies non-linear constraints.
* It transforms unbounded problems to bounded ones.
* It incorporates artificial variables to handle inequalities.
* It speeds up the computational process by parallel processing.

7. In which scenario would using soft constraints be most appropriate?

* Ensuring a rocket stays on its launch trajectory
* Deciding the number of units to produce in a factory
* Ensuring the safety limits in a nuclear reactor
* Minimizing costs in a supply chain with a preference for local suppliers

8. How is the feasible region affected when a new constraint is added to an optimization problem?

* It becomes a subset of the previous region.
* It becomes a superset of the previous region.
* It remains unchanged.
* It always becomes unbounded.

9. How do constraints influence the shape of the solution landscape in optimization problems?

* They always make it concave.
* They restrict the set of feasible solutions.
* They ensure multiple optimal solutions.
* They make the landscape smoother for easier navigation.

10. Which of the following constraints can lead to a non-convex feasible region in an optimization problem?

* Linear equality constraints
* Linear inequality constraints
* Quadratic equality constraints
* Both A and B

11. What is the typical method to handle non-linear constraints in optimization problems?

* Using the Simplex method
* By linearizing the constraints
* Using interior-point methods
* Implementing Monte Carlo simulations

12. How can duality in linear programming be best described?

* It allows for converting maximization problems to minimization ones.
* It transforms non-linear problems into linear ones.
* It involves finding the shortest path in a network.
* It converts continuous problems to discrete ones.

13. Which of the following is NOT a basic requirement for linear programming?

* Linearity of relationships.
* Finite number of variables and constraints.
* Non-negativity of variables.
* Variables can take fractional values.

14. What is the primary application of linear programming in business?

* Analyzing qualitative data.
* Decision making under uncertainty.
* Decision making under constraints.
* Random sampling of data.

15. How are objective functions typically represented in linear programming?

* As an inequality.
* As a set of discrete values.
* As a quadratic equation.
* As a linear combination of decision variables.