Name: _____ **Date:** _____

Your Blueprint for Digital Logic: 9th Grade Algorithmic Design Quiz

Ninth graders refine their computational thinking by dissecting logistical bottlenecks and optimizing data flow in complex, real-world systems.

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1. When designing a public transit routing system, which strategy involves breaking the city-wide network into smaller neighborhood zones to simplify pathfinding?

A. Linear Sequencing
B. Problem Decomposition
C. Data Normalization
D. Recursion Elimination

2. A 'Greedy Algorithm' always finds the globally optimal solution for every possible problem because it makes the best choice at each individual step.

A. True
B. False

3. In the context of evaluating an algorithm for a massive social media database, the study of how the execution time increases as the number of users grows is known as _____.

A. Step-wise Refinement
B. Functional Distribution
C. Resource Allocation
D. Time Complexity

4. You are building an automated playlist generator. To ensure the software doesn't crash when a user has zero songs in their library, you must account for this specific scenario, known in CS as a/an:

A. Edge Case
B. Syntax Error
C. Logic Gate
D. Infinite Loop

5. An architect uses a 'Divide and Conquer' approach to manage a skyscraper project by assigning plumbing, electrical, and structural tasks to different teams. Which computational concept does this mirror?

A. Encapsulation
B. Parallel Processing
C. Subproblem Modularization
D. Iterative Looping

6. When a programmer uses 'Rubber Duck Debugging'—explaining their algorithm line-by-line out loud—they are primarily looking for _____ errors.

Name: _____ Date: _____

A. Hardware
B. Logic
C. Compiling
D. Semantic

7. Heuristics are 'rules of thumb' used in algorithm design to find a 'good enough' solution when finding the perfect solution is too computationally expensive.

A. True
B. False

8. A shipping company wants to determine the fastest delivery route through 50 cities. If they use a 'Brute Force' algorithm, they will:

A. Use a map to estimate the best visual path
B. Only check the distances between major hubs
C. Calculate every possible combination of routes
D. Stop as soon as they find any valid route

9. Pseudo-code is a strict programming language like Python or C++, and it must be compiled before an algorithm can be tested.

A. True
B. False

10. The process of removing unnecessary details to focus on the essential characteristics of a problem is called _____.

A. Abstraction
B. Encryption
C. Inheritance
D. Compilation