**Name:** _____ **Date:** _____

## Beat the Bot: Mastering 7th Grade Algorithmic Logic

Beyond simple instructions—analyze logic gates and input validation sequences in this rigorous problem-solving challenge for mid-year assessment.

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**1. A biologist is designing an algorithm to track bird migrations. If they break the task into 'Identifying Species,' 'Recording GPS Coordinates,' and 'Calculating Flight Speed,' which process are they using?**

A. Linear Search
B. Problem Decomposition
C. Data Encryption
D. Binary Conversion

**2. An algorithm that takes 1,000 steps to find a name in a phone book is considered more 'efficient' than one that takes 10 steps for the same list.**

A. True
B. False

**3. When building an automated thermostat, you write a sequence: IF temperature < 68, THEN turn on heater. This logical structure is known as a _____.**

A. Variable
B. Conditional Statement
C. Syntax Error
D. Infinite Loop

**4. A library wants to find a specific book on a shelf where all books are already alphabetized. Which algorithm would be the most efficient for this task?**

A. Random Search
B. Linear Search from the beginning
C. Binary Search (Dividing the shelf in half)
D. Removing all books until the right one is left

**5. During the final phase of creating a transit app, the developer runs the code through a 'test suite' to find and fix errors. This process is called _____.**

A. Abbreviation
B. Decomposition
C. Debugging
D. Compilation

**6. A 'Flowchart' is a visual representation used to map out the steps of an algorithm before any actual coding begins.**

A. True

**Name: _____ Date: _____**

B. False

**7. An engineer is designing a self-driving car algorithm. The car must stop if a pedestrian is detected OR if a red light is seen. What type of logic gate is this?**

A. AND gate
B. NOT gate
C. OR gate
D. NULL gate

**8. If an algorithm for an elevator is written to go up forever and never check for floor requests, it has encountered a(n) _____.**

A. Infinite Loop
B. Binary Split
C. Base Case
D. Efficiency Gain

**9. Input validation is the part of an algorithm that ensures the data entered (like an age or date) is sensible and usable before processing it.**

A. True
B. False

**10. Which of these is an example of 'Abstraction' in algorithm design?**

A. Writing every single line of code in one sitting
B. Counting every letter in a book manually
C. Focusing on what a 'Send Email' button does rather than the complex server code behind it
D. Deleting an algorithm because it has a bug