

Name: _____ Date: _____

Answer Key: When Algorithms Decide: 6th Grade Logic & Program Flow Quiz

Synthesize complex logic by evaluating nested structures and modular design beyond basic syntax to solve real-world computational puzzles.

1. A smart thermostat is programmed to turn on the heater ONLY if the temperature is below 68°F AND the 'Eco-Mode' variable is set to False. If the temp is 65°F but Eco-Mode is True, what happens?

Answer: B) The heater stays off because both conditions were not met.

This uses a Boolean AND operator. For the code inside the conditional to execute, every individual condition joined by 'AND' must be true simultaneously.

2. In a digital library system, you create a _____ to handle the task of calculating late fees so you can reuse that same logic for books, magazines, and DVDs without rewriting it.

Answer: C) Function

Functions promote modularity and 'DRY' (Don't Repeat Yourself) programming by wrapping reusable logic into a single named block.

3. An infinite loop is a useful programming tool specifically designed to help a computer process large datasets faster by never stopping.

Answer: B) False

Infinite loops are generally logic errors that cause programs to freeze or crash because the 'exit condition' is never met; they do not improve speed.

4. You are designing a drone's navigation system. Which structure is best suited for keeping the drone in the air as long as the battery level is above 10%?

Answer: B) A While loop

A 'While' loop repeatedly executes code as long as a specific condition remains true, making it ideal for continuous monitoring tasks.

5. If you are writing a script for a space rover and use the statement 'speed = 50', the word 'speed' is acting as a _____.

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Answer: C) Variable

Variables act as named containers for data values that can be changed or referenced throughout the program's execution.

6. Passing a 'parameter' into a function allows the function to use specific data provided by the user or another part of the program.

Answer: A) True

Parameters are placeholders in a function definition that accept input values, allowing the same function to produce different results based on the input.

7. Consider a 'For' loop that iterates through a list of 100 students. If you nest an 'If' statement inside that loop to check for 'Honor Roll' status, how many times will the conditional check run?

Answer: C) 100 times

Since the conditional is nested inside the loop, the program will evaluate that 'If' condition for every single item in the list of 100 students.

8. A programmer writes specialized code for a vending machine. To handle different outcomes for 'Soda', 'Chips', and 'Candy', they should use _____ logic.

Answer: B) Conditional

Conditional logic (like If-Then-Else or Switch cases) allows the program to branch and follow different paths based on the user's input selection.

9. In programming, a variable named 'User_Age' can usually store a text string like 'Twelve' just as easily as the number 12, depending on the language's typing rules.

Answer: A) True

Variables can hold different data types, including integers and strings. Many modern languages allow variables to change types or be defined as strings initially.

10. In a social media app's code, a 'counter' variable tracks 'Likes'. Every time a user clicks the heart, the code executes 'Likes = Likes + 1'. This is an example of:

Answer: A) An incrementing variable update

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Updating a variable using its own current value plus a new amount is a fundamental concept in creating interactive applications and keeping track of state.