



In Partnership With



Name: \_\_\_\_\_

Date: \_\_\_\_\_

Period: \_\_\_\_\_

## Mini-Drone Project Quiz Answer Key (24 pts)

**Matching (1 pt each). Clearly write your answers in the blanks.**

- |                                                                                                            |                  |
|------------------------------------------------------------------------------------------------------------|------------------|
| __C__ 1. Evaluates a condition to determine if a task should be executed                                   | A. Variable      |
| __D__ 2. Modular piece of code that perform a defined task that can be used more than once                 | B. Potentiometer |
| __E__ 3. Consists of short English phrases to explain specific tasks within a program.                     | C. If statement  |
| __A__ 4. A placeholder within your code that is assigned a value.                                          | D. Function      |
| __F__ 5. Description of the behavior of your code that makes is easy for others to understand your program | E. Pseudocode    |
| __B__ 6. A simple analog device that provides variable resistance                                          | F. Comment       |

**True/False (1 pt each). Must write the word True or False in the blank provided.**

- False 1. When the value of a sensor returns a range from 0 to 1023, you should use digitalRead to read the value.
- False 2. The speed of a sound wave is always the same regardless of the medium it is traveling through
- False 3. In aircraft motion, when the drag is greater than the lift, the plane will fall.
- True 4. The height of a wave is also called the amplitude. This characteristic determines how loud a human hears the sound.
- True 5. The ultrasonic sensor produces a sound wave whose frequency is so high that humans cannot hear the sound that it emits.



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**Multiple Choice (2 pts each). Write answers in blanks. Circled answers will not be graded.**

- B   1. Using an Arduino, you generally \_\_\_\_\_ inputs and \_\_\_\_\_ outputs.
- a. Write to, Read from
  - b. Read from, Write to
  - c. Read from, Read from
  - d. Write to, Write to
- B   2. The purpose of a feedback control system is to:
- a. Create the set point for a variable
  - b. Keep a controlled variable close to its set point
  - c. To give feedback to the Arduino through the digitalWrite or digitalRead commands
  - d. Program a modular piece of code to perform a defined task that can be used more than once
- B   3. \_\_\_\_\_ is the upward force acting on an airfoil.
- a. Thrust
  - b. Lift
  - c. Weight
  - d. Drag



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**Free Response (3 pts each)**

1. Your object is 27 cm away from the ultrasonic sensor. How many microseconds do you expect the ultrasonic sensor to return?

1,574 microseconds

2. Describe two ways that altitude can be used in agricultural drones to improve farming methods.
  - Getting close enough to crops to spray products
  - Camera resolution when getting imagery
  - Avoiding obstacles