**Test 1 - Control System**

**1. What function does a logic gate perform?**

1. A comparison
2. An addition
3. An operation
4. A reversal

**2. With inputs of 1 and 1, what does an XOR gate output?**

1. 1
2. 0
3. Illegal operation

**3. How does a flip-flop preserve its state?**

1. Loop of logic gates
2. Magnetic storage
3. Solid state storage
4. Separate power sources

**4. What is the difference between hardware and software looping?**

1. Technique used to loop
2. Speed of looping
3. Running instructions in loop
4. Ability to reverse loop

**5. What is the main advantage of ground as a return path?**

1. Simple circuits
2. Less wires
3. Faster travel time
4. Protection from static

**6. Why does earth grounding not always work?**

1. Resistance
2. Noise
3. Differences in voltage
4. Changes of voltage

**7. What is not considered a form of control?**

1. User input
2. Hardware
3. Software
4. Physical interaction

**8. What does a carry signal mean in binary addition?**

1. Addition of the numbers resulted in a number higher than the current position
2. Addition of the numbers resulted in a 2
3. Addition of the numbers resulted in a 0
4. Addition resulted in too high of a number

**9. What is the advantage of PID over bang-bang control?**

1. Overshoot compensation
2. Accurate control
3. Fast arrival time
4. Robustness

**10. When would bang-bang control be appropriate?**

1. Driving a car
2. A free-spinning wheel
3. Moving an arm
4. Adjusting motor speed