**Robotics 10 – Course Questions for Exam Day Oral Test**

**Posted on Wednesday, June 16, 2021**

The test is divided into sections. Group A/Group B Robotics 10 students will meet as individual groups and build on each other’s answers. Each will be marked on their knowledge of the course material. Questions will be directed to one person initially with others invited to add to the answer as follow-up. The groups are small, so there will be lots of input expected.

**Section 1 – Safety & Career Opportunities**

1. List some important safety rules for the robotics lab.
2. Name and describe a potential career you could have in robotics.
3. Why is it important that we train people in robotics now?
4. What is a short circuit and why is it dangerous?

**Section 2 – Electronics**

1. Breadboard make it easier to make circuits. How? How would you make a circuit without a breadboard?
2. On the white board in front of you draw each of the symbols requested by the instructor (see the terms and symbols study sheet to review these). Then tell how the device is used in a circuit. What does it do? Students will take turns.
3. Why is it important that you know how to draw these symbols?
4. What are the two kinds of circuits (series and parallel) and how does the current flow?
5. How can you tell which leg of an LED is negative if someone has cut the legs to be the same length?
6. Use the Resistor Chart to tell your teacher the ohms of a resistor provided to you.
7. What is the job of a resistor?
8. Why do you need so many kinds of resistors?
9. What is a potentiometer? How is it used?
10. Demonstrate how to use a multimeter to calculate the ohms of a resistor.
11. What is the purpose of soldering?
12. What does a good job of soldering look like?
13. Name some safety precautions for soldering.

**Section 3 - Arduino**

1. What is a microcontroller?
2. What does it mean when we say that Arduino is “open source”?
3. What is Arduino IDE language?
4. What are the two main Void functions in an Arduino sketch?
5. How many volts are used to run an Arduino uno?
6. Name two different kinds of variables and describe the difference.
7. There are five different types of data used in computer coding. Name and describe two of them. (The group can add marks by adding more.)
8. What are flow charts, and how are they useful?

**Section 4 – Control Structure & Data**

1. On the white board in front of you draw each of the operators used in coding, as requested by the instructor (see the Operators study sheet to review these). Then tell how the operator is used in a code. What does it do? Students will take turns.
2. What is an “If” statement and in what circumstances would it be used in code?
3. What is an “If/Else” statement and in what circumstances would it be used in code?
4. What is a “While Loop” and when would it be used in code?
5. Describe “Pulse Width Modulation”.
6. When would you use PWM.
7. What is the pulse time in which the voltage is high called in PWM? Describe how this voltage can be adjusted.
8. What type of coding is used for PWM?
9. Which pins on the Arduino can you use with analog?
10. What is the range of analog values?
11. What is the purpose of an LCD in projects?
12. How can you display data without an LCD (using your Arduino IDE program)?

**Section 5 – Project Planning**

1. Why is planning important when you are doing a project?
2. What components are needed to plan well for a project?

**Section 6 – Course Assessment**

1. What are you most proud of yourself for learning in the course?
2. We did not get to the final project creation point due to time constraints during the pandemic. It would have been nice to do the build you planned. Do you think you could have made your project work?
3. What suggestions do you have to make the course more practical?