CSE 102 – Midterm Practice Problems

1. How do you program a pin to be an output pin?
2. How do you set the output value high? Low?
3. How do you program a pin to be an input pin?
4. When should you use INPUT vs. INPUT_PULLUP as the mode?
5. What is the resistor color code for a 100Ω resistor?
6. If you wish a pulse-width modulated output to give an output value that is 50% of full scale, what value should you provide to the analogWrite() function?
7. What is the range of possible analog input values that might be returned from an analogRead() method invocation?
8. What is the purpose of the analogReference() method?
9. How many bytes are each of the following data types: char, int, long int, unsigned int?
10. Be familiar with converting back and forth between binary and hex, as well as binary and decimal.
11. How many fractional bits are in a number using the Q1.15 representation?
12. How many integer bits are in a number using the Q1.15 representation?
13. How do you tell if a floating point number is negative?
14. Is it possible to represent -0 in floating point? If so, how?
15. What style of negative number representation is used for floating point exponents?
16. Know how to read the ASCII table, and how UTF-8 encoding of characters relates to ASCII (i.e., where to they overlap, and how?).
17. Name the registers in the AVR instruction set architecture.
18. What does the following instruction do?   adc r16,r24
19. Write a sequence of assembly language code that implements the following operations:
    ```
    int a, b;
    a = 3;
    b = a + 22;
    a = a << 2;
    ```
20. What bit of the SREG is checked to decide whether or not to branch when using the breq instruction?

Also, look at all of the quiz questions and questions that are posed in the studios (whether or not you got to them when you were doing your studio). Obviously, the studio questions that require using the Arduino to answer are unlikely, but they clearly point to pencil and paper questions that explore exactly the same material.