1. Perform the following conversions (suggest you go through binary for c and d): 1 point
   a. Convert the hex number E42B to binary
   b. Convert the octal number 461 to binary
   c. Convert the hex number F3B to octal
   d. Convert the octal number 246 to hex

2. What is a problem you would face in trying to translate ASCII to other languages?

3. Perform the following conversions, assuming 8 bits for the representation:
   a. Convert -52 to binary using sign magnitude notation.
   b. Convert -49 to binary using two's complement notation

4. What is the decimal value of 11111111 if
   a. the value is in sign magnitude notation?
   b. the value is in two's complement notation?

5. What is the range of values that can be represented if 6 bits are available for representation:
   1 point
   a. unsigned magnitude notation
   b. sign magnitude notation
   c. two's complement notation
   d. How many bits would you need to represent -512 in sign magnitude notation? What about in two's complement?

6. Perform the following binary arithmetic operations, assume we are using 2's complement representation. Leave your answer in binary and list any concerns. 1 point
   a. 101101 + 010101:
   b. 100001 + 101001:
   c. Would you be able to add numbers in sign magnitude notation the same way?
7. Translate the following from binary to decimal and vice versa:
   a. 100011.11
   b. 22.125

8. Using the ASCII code set,
   a. show the internal binary representation for the following character string: f(x)
   b. what character does 0100 1101 represent?

9. True or False: A digital audio sample can be converted back to the EXACT analog sound wave it was created from. Justify your response.

10. Why does increasing the sampling rate improve the quality of an audio sample?

11. How many bytes does it take to store 10 seconds of video, if the video is 30 frames per second and each frame is 1920x1080 pixels (in RGB)? Show your work. 1 point

12. What is white in RGB? What is black in RGB? Give two other RGB values that are similar, but not exact, and two RGB values that are very different. In both cases, give the values in decimal.

13. Discuss the trade-offs of increasing pixel bit depth. Give at least one reason why you might want to do increase pixel bit depth and one reason why you might not want to do this.

14. Rank the following from least size to greatest: KB, GB, Mb, MB, Gb, Kb

15. Assume that a=2, b=5, and c=5. What is the result of each of the following Boolean expressions?
   a. [(a + b) > c] AND (b < c)
   b. NOT [(a == b) OR (b == c)]

16. Provide a truth table for 3-input AND and 3-input OR. 1 point
17. Given the following circuit diagram, what is the value output when input A = 0, B = 1, C = 1, D = 0, E = 0?

18. Label the partial Boolean expressions above each logic gate below, then provide the final Boolean expression for the circuit. Show your work. 1 point.