This is an open-book, open-note test. You may not communicate with anyone during the test in any manner. If you don’t understand a question, you may ask the instructor. Partial credit is possible so please show all work and attempt to answer all questions. Good luck.

1. How many things can be represented with:
   a. 8 bits ________________
   b. 16 bits ________________

2. Convert the following base-10 integers into base-2:
   a. 24________________
   b. 53 __________________
   c. 127 __________________
   d. 128 ____________________

3. Convert the following base-10 floating-point numbers into base-2:
   a. 123.4 ____________________________
   b. 5.625 __________________________

4. Convert the following base-16 integers into binary and octal:
   a. FAD __________________________
   b. 1234 ______________________________________________

5. Give a good RGB value for the color YELLOW. R = ________________
   G = ________________________
   B = _________________________

6. a. Describe the process of digitization of an analog audio signal by labeling the sketch below.

   ![Sketch of analog audio signal]

   b. Assuming the amplitude of the signal is being decimated into a maximum of 12 different levels, how many bits are required to digitize each sample? __________

c. Assuming the temporal sampling rate is 44,000 samples/sec, what is the total time shown in this sample? ________________________

7. Given a 32 bit (binary) word taken from a random address in a computer’s memory, describe how you would determine what this binary string represents, or explain why you would not be able to determine anything about its purpose.

8. A digital camera converts a scene in the real-world into a rectangular array of pixels, each pixel being made up of three 8 bit values. Support or refute the argument that this is an accurate representation of the scene.

9. Briefly explain the difference between lossy and lossless compression.

10. Define the extended ASCII and Unicode and explain why Unicode is important.

    ASCII

    Unicode

11. Provide the year in which each of the following occurred:

    _____ Windows* first developed by Chase Bishop
    _____ Windows 1.0 released by Microsoft
    _____ Windows 2.0 released
    _____ Windows 2.1 X
    _____ Windows 3.0
    _____ Windows 3.1 X
    _____ Windows Vista
    _____ Windows 95
    _____ Windows 98
    _____ Windows ME
    _____ Windows 8
    _____ Windows 8.1
    _____ Windows XP
    _____ Windows 10

    * originally called the Interface Manager

12. Discuss the importance of the advertising campaign that used the slogan “Why 1984 will not be like 1984?”.