

Name: \_\_\_\_\_

1. Develop a protocol that allows the user to send a calendar date (mm/dd). What is the **minimum** number of bits necessary? Hint: What is the maximum decimal number needed for each?

2. Develop a protocol that allows a user to send a time (use 24hr military time in hh:mm:ss). What is the **minimum** number of bits necessary? Hint: What is the maximum decimal number needed for each?

3. You have a coordinate grid that is 96 x 96. Assuming that you encode the x and y coordinate as separate numbers, what is the minimum number of bits that you will need to encode a coordinate in that space?

- a. 16
- b. 14
- c. 13
- d. 10

4. Convert:  $111_{10} = \underline{\hspace{2cm}}_2 = \underline{\hspace{2cm}}_{16}$

5. The web color standard uses triplets of RGB. Convert the following binary color into hexadecimal values and then decimal values of Red, Green and Blue:  $111011101010_2$

6. How many bits per color are in problem 5? How many total bits are in problem 5.

7. Can you ever have a 17 bit RGB color? Explain....