Homework 2 Solution

(Binary, Data representation, Gates)

Due: 4:00pm, Mar. 13th

1. Convert the following decimal numbers to binary:

a. 3 ; b. 10; c. 234; d. 8179

a.11; b.1010; c. 11101010; d. 1111111110011

2. Convert the following decimal numbers to octal:

a. 4 ; b. 11; c. 224; d. 1792

a. 4; b.13; c. 340; d. 3400

4. Convert the following decimal numbers to hexadecimal:

a. 13; b. 19; c. 224; d. 2781

a. D; b. 13; c. E0; d. ADD

5. Convert the following binary numbers to decimal:

a. 10; b. 101; c. 11011; d. 1111010001

a. 2; b. 5; c. 27; d. 977

6. Convert the following octal numbers to decimal:

a. 712; b. 20131;

a. 458; b.8281

7. Convert the following binary numbers to octal:

a. 10; b. 101;

a. 2; 5

8. Perform the following binary additions.

a. 101+11; b. 11+1101

a. 1000; c. 10000

9. Perform the following binary subtraction.

a. 101-11; b. 11-1

a. 10; b. 10

10. How many things can be represented with 8 bits?

256

11. How would the following string of characters be represented using run-length encoding?

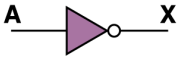
xxxxxxyyzzzzzz

*x6yy*z6

12. What does color depth indicate?

The amount of data that is used to represent a color

13. Give the three representations of a NOT gate and say in words what NOT means.

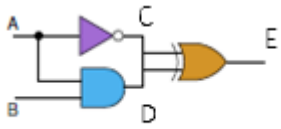
Boolean Expression	Logic Diagram Symbol	Truth Table
X = A'		A | X 0 | 1 1 | 0

A NOT gate accepts one input signal (0 or 1) and returns the opposite signal as output

14. What happens when an electric signal is grounded?

It outputs 0.

15. Show the behavior of the following circuit with a truth table:



A	B	C	D	E
0	0	1	0	1
0	1	1	0	1
1	0	0	0	0
1	1	0	1	1