**Homework #1**

5 points each.

1. What are the largest and smallest unsigned numbers that can be expressed with 10 bits?

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2. Convert the hexadecimal number F9A5 to binary and then from binary convert it to octal.

3. Convert decimal 39.375 to binary and hexadecimal.

4. Express the following numbers in decimal: (11010.1001)2, (18.5)16, and (37.24)8

5. Add and multiply the following numbers without converting them to decimal

(a) Binary number 1101 and 111.

6. Obtain 1’s and 2’s complement of the following binary numbers

(a) 10101011 (b) 01001110 (e) 00000000

7. Convert decimal +54, -54, -25, and +25 to binary using enough digits to accommodate the numbers. Then perform the binary equivalent of (+54) + (+25), (+54) + (-25), (-54) + (+25), and (-54) + (-25). Convert then answers back to decimal and verify that they are correct.

8. Convert decimal 256 and 325 to BCD codes, and perform their addition using the BCD codes.

9. Convert the characters “8Ce3” to ASCII codes. Append an odd parity bit to **each letter** at the left.

10. The following is a string of ASCII characters whose bit patterns have been converted into hexadecimal for compactness: 4A EF 68 6E 20 C4 EF E5. Of the 8 bits in each pair of digits, the leftmost is a parity bit. The remaining bits are the ASCII code.

(a) Convert to bit form and decode the ASCII.

(b) determine the parity used: odd or even.