HW1

1. (8%) What is the exact number of bits in a system that contains (a) 16M byte and (b) 8.3G byte?

2. (24%) Convert the following numbers from the given base to other three bases listed in the table:

Decimal	Binary	Octal	Hexadecimal
384.57	?	?	?
?	11010.101	?	?
?	?	36.42	?
?	?	?	F9.4

3. (16%) Perform the subtraction with the following unsigned binary numbers by taking the 2's complement of the subtrahend. (a) 0111 – 0110, (b) 10010 – 1010, (c) 1010110 – 1111010, (d) 101101 – 110.

4. (16%) Convert decimal +47 and +38 to binary, using the signed-2's-complement representation and enough digits to accommodate the numbers, Then, perform the binary equivalent of (+47)+(-38) and (-47)+(-38) using addition. Convert the answers back to decimal and verify that they are correct.

5. (10%) Write the word "Logic" in ASCII using an eight-bit code including the space. Treat the leftmost bit of each character as a parity bit. Each 8-bit code should have even parity.

6. (8%) For an 8-bit sequence is 1101 0111. What is its content if it represents (a) two decimal digits in BCD? (b) two decimal number in the Excess-3 code? (c) an 8-bit unsigned number? (d) an 8-bit signed number?

7. (6%) If you have 27 books and want to give each book a unique id with a binary number. If we want to use as least as possible the number of bits as the id, how many bits do you need?

8. (12%) Find the Gray code sequence of 12 code words.