Homework 1

Number Conversion

(1) Convert the following numbers with the indicated bases to decimal.
$(ABCD)_{16}$ $(10101010)_2$ $(666)_8$

(2) Convert the following numbers with the indicated bases to hexadecimal
$(65536)_{10}$ $(32767)_{10}$ $(10110110)_2$

(3) Convert the following numbers with the indicated bases to binary.
$(16383)_{10}$ $(BEEF)_{16}$ $(456)_8$

Operations

(1) Given A and B with hexadecimal expression 0xCD and 0xA3 respectively. Calculate the values of the following expressions

a) A & B
b) A && B
c) A | B
d) A || B
e) A ^ B
f) ~A | ~B

(2) Fill in the table below with the results of shift operation given below (**Assume X is 8-bit wide**)

X	X<<4	X>>3(Logical)	X>>3(Arithmetic)
0xC3			
0x0F			
0xAB			
0x5E			

(3) Design C expressions using bitwise (& | ~ ^) and logical (&& || !) operators, which return 1 under the specific conditions described below, otherwise return 0.

A. all bits of x are 1.
B. all bits of x are 0.
C. bits of x's least significant byte are 1.
D. bits of x's least significant byte are 0.

(4) Design a C expression, which generates a word (32-bit) consisting of the lower 16 bits of x and the remaining bits of y.

For example, x = 0x89ABCDEF and y = 0x76543210, it will generate 0x7654CDEF