CMPE 120 Fall 2016 Homework #1

Problem 1: Perform the following number conversion

(A) Ox39A7F8 to binary 0011 1001 1010 0111 1111 1000

(B) Binary 1100100101111011 to hexadecimal

C 9 7 B

Problem 2: Fill in the blanks below to represent numbers with different powers of 2.

n (power)	2**n (in decimal)	
3	8	
5	?	32
9	?	512
16	?	$2^6 \cdot 2^{10} = 64 \times 1024 = 65536$

Problem 3: Solve the following arithmetic problems and give answers in hexadecimal.

(A) Ox503c + Ox8 = ? 0x5044

(B) Ox503c - Ox40 = ? 0x4FFC

(C) Ox503c + 64 = ? 0x503C + 0x40 = 0x507C

(D) Ox50ea - Ox503c = ? 0x00AE

Problem 4: Fill in the blanks below to show the resulting Boolean operations.

a = 01101001

b = 01010101

Boolean operation	result	
~a (NOT)	?	10010110
~b	?	1010 1010
a & b (AND)	?	01000001
a | b (OR)	?	01111101
a ^ b (XOR)	?	00111100

Problem 4: Fill in the blanks below for the shift operations.

X	x(binary)	x<<3(binary)	logical x>>2 (binary)	arithmetic x>>2 (binary)
OxC3	11000011	00011000	00110000	11110000

Problem 5: A, B and C below are in 2's complement representation. What are their respective equivalent values in decimal.

A = 1011 -5

B = 11011 -5

C = 111011 -5

Problem 6:

X and y are represented as 5-bit integers in 2's complement.

(A) Write 32 numbers in both binary (5-bit) and decimal that can be represented by x

(B) What is the maximal value of x +15

(C) What is the minimal value of x -16

(D) Fill in the blanks below

x	y	x+y(in 6-bit)	x+y(in 5-bit)	x+y(in decimal)
10100(-12)	10001(-15)	100101	00101	5
11000(-8)	11000(-8)	110000	10000	-16
10111(-9)	01000(8)	111111	11111	-1
00010(2)	00101(5)	000111	00111	7
01100(12)	00100(4)	010000	10000	-16