HACETTEPE UNIVERSITY
DEPARTMENT OF COMPUTER ENGINEERING
BBM231 LOGIC DESIGN

Homework 1 (For all sections)

Assigned : 22.10.2018
Due : 05.11.2018

Hand in your homework solutions in class.

QUESTIONS:

Q1. Convert the following decimal values to

8-bit Signed magnitude : $(+24)_{10}=(\_\_\_\_\_)_2$ $(-24)_{10}=(\_\_\_\_\_)_2$

8-bit 1's complement : $(+24)_{10}=(\_\_\_\_\_)_2$ $(-24)_{10}=(\_\_\_\_\_)_2$

8-bit 2's complement : $(+24)_{10}=(\_\_\_\_\_)_2$ $(-24)_{10}=(\_\_\_\_\_)_2$

Q2. You are given the numbers: 01010000 and 11101111. What are the values of these number in decimal if they are represented by:

Signed magnitude : $(01010000)_2=(\_\_\_\_\_)_{10}$ $(11101111)_2=(\_\_\_\_\_)_{10}$

One's complement : $(01010000)_2=(\_\_\_\_\_)_{10}$ $(11101111)_2=(\_\_\_\_\_)_{10}$

Two's complement : $(01010000)_2=(\_\_\_\_\_)_{10}$ $(11101111)_2=(\_\_\_\_\_)_{10}$

Q3. After converting to 8-bit binary, subtract the following numbers using complements:

20-15=? 15-20=?

Q4. Reduce the following Boolean expressions to the indicated number of literals:

a. F=A'C'+ABC+AC' (to three literals)

b. F=A'B(D'+C'D) + B(A+A'CD) (to one literal)

c. F= ABCD+A'BD+ABC'D (to two literals)

Q4. You are given the function **F(x,y,z)== xy+xy'+y'z.**

a) Fill the truth table.
b) Write the function in sum-of-minterms form.
c) Write the function in product-of-maxterms form.

x	y	Z	F
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

Q6. Express the following function as a sum-of-minterms and as a product-of-maxterms:

F(A,B,C,D)=B'D+A'D+BD