CMPE-223 Assignment # 1

Last Due Time: 27/10/2021 – 16:30

Q.1) [30 pts]

a) $(621.75)_{10}$ $=$ $($ $)_2$

          $=$ $($ $)_4$

          $=$ $($ $)_8$

          $=$ $($ $)_{16}$

b) Using 8-bit 2's complement arithmetic; perform the following signed numbers operations. In each case, indicate whether an overflow occurs or not. You don't have to express the result in decimal. (Note that 2's complement is defined in the binary number system).

   i) $(6C)_{16} - (-64)_{10}$

   ii) $(-128)_{10} + (2F)_{16}$

Q.2) [20 pts]

Find the equivalent value of 10010110 if
a) it is an unsigned number
b) it is a signed number in signed-magnitude representation system
c) it is a signed number in 1's complement representation system
d) it is a signed number in 2's complement representation system
e) it is a BCD code

a)		**b)**	

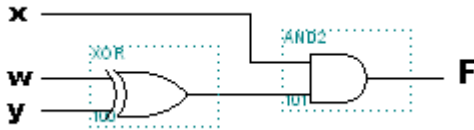| **c)**		**d)**	

e)	

Q.3) [20 pts]
Using algebraic manipulation, prove that $F_1(w,x,y,z) = F_2(w,x,y,z)$.
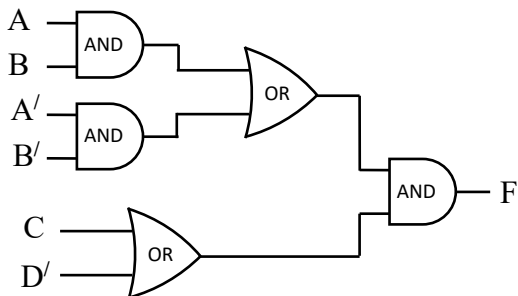[Hint: Start with F_1, use some algebraic manipulations to obtain F_2]

F_1 $= w'xyz' + wxy'z' + w'xyz + wxy'z$

Q.4) [30 pts]
Consider the following circuit of the Boolean function $F(A,B,C,D)$

a)   Using bubbles convert the above circuit into all NAND gates.
b)   Using bubbles convert the above circuit into all NOR gates