Solutions - Quiz 2

(February 7th @ 5:30 pm)

PROBLEM 1 (40 PTS)

- Complete the following table:

REPRESENTATION			
Decimal	**Sign-and-magnitude**	**1's complement**	**2's complement**
0	00	1111	0
13	01101	01101	01101
-4	1100	1011	100
-9	11001	10110	10111

- Convert the following decimal number to its 2's complement representation: -10.25 (5 pts)
  $10.25 = 01010.01_2 \rightarrow = -10.25 = 10101.11_2$

PROBLEM 2 (25 PTS)

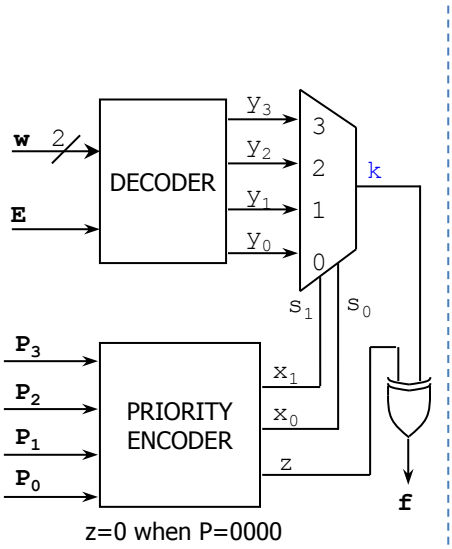
- The figure shows two 8-bit operands represented in 2's complement. Perform the signed (2C) 8-bit addition operation, i.e., complete all the carries and the summation bits. Also, indicate the corresponding decimal numbers for the 8-bit operands and the 8-bit result.

Does this 8-bit operation incur in overflow? Yes ~~No~~
Value of the overflow bit: $c_8 \oplus c_7 = 0$
Value of carry out bit: $c_8 = 1$

Decimal values		c_8	c_7	c_6	c_5	c_4	c_3	c_2	c_1	c_0	
		1	1	0	0	0	1	0	1	0	
-43	=	1	1	0	1	0	1	0	1		+
-27	=	1	1	1	0	0	1	0	1		
-70	=	1	0	1	1	1	0	1	0		

PROBLEM 3 (35 PTS)

- Complete the timing diagram of the circuit shown below: $y = y_3y_2y_1y_0$, $x = x_1x_0$



z=0 when P=0000