Solutions - Quiz 2

(October 8th @ 5:30 pm)

PROBLEM 1 (35 PTS)

- Complete the following table:

REPRESENTATION			
Decimal	**Sign-and-magnitude**	**1's complement**	**2's complement**
-5	1101	1010	1011
0	00	111	0
-4	1100	1011	100
13	01101	01101	01101

- Convert the following decimal number to its 2's complement representation: -14.25 (5 pts)
  $14.25 = 01110.01 \rightarrow -14.25 = 10001.11_2$

PROBLEM 2 (30 PTS)

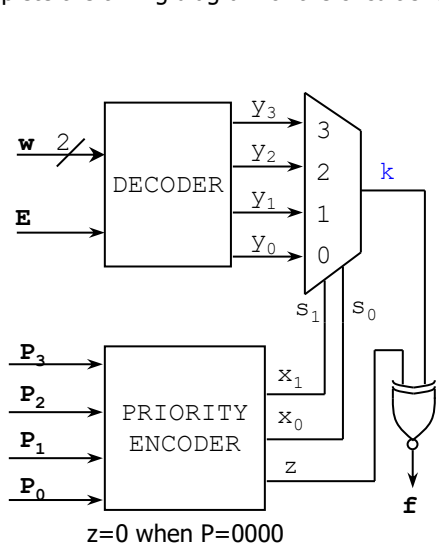
- The figure shows two 8-bit operands represented in 2's complement arithmetic. Perform the signed (2C) 8-bit addition operation, i.e., complete all the carries and summation bits. Also, indicate the corresponding decimal numbers for the 8-bit operands and the 8-bit result.

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

	c_8	c_7	c_6	c_5	c_4	c_3	c_2	c_1	c_0
	0	1	0	0	0	1	1	1	0
103 =	0	1	1	0	0	1	1	1	+
85 =	0	1	0	1	0	1	0	1	
-68 =	1	0	1	1	1	1	0	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