Solutions - Quiz 2

(February 9th @ 5:30 pm)

PROBLEM 1 (40 PTS)

• Complete the following table:

REPRESENTATION			
Decimal	Sign-and-magnitude	1's complement	2's complement
-10	11010	10101	10110
6	0110	0110	0110
-5	1101	1010	1011
-7	1111	1000	1001

Convert the following decimal number to its 2's complement representation: -7.75 (5 pts)

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7.75 = 0111.11_2 \rightarrow -7.75 = 1000.01_2
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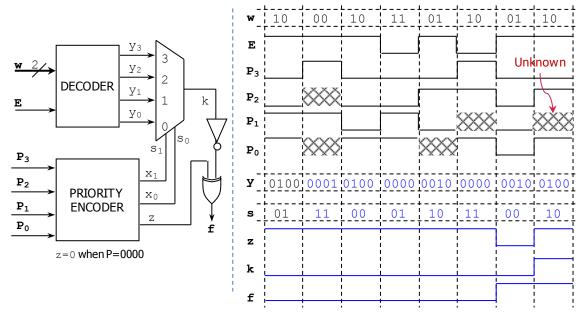
PROBLEM 2 (20 PTS)

Perform the following operation in the 2's complement system, i.e., provide the summands and the result in 2's complement representation (<u>indicate the carries</u>). Use the minimum number of bits to represent both the summands and the result so that the overflow bit is 0.
✓ -14 + 21

 $-14 + 21 = +7 \in [-2^5, 2^5-1] \rightarrow \text{no overflow}$

PROBLEM 3 (40 PTS)

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



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