

Perform the appropriate binary arithmetic function for the following binary numbers assuming a 6-bit 2's complement system.

- Indicate whether or not there is an overflow condition, with brief explanation.
- Also, convert the numbers to decimal to check your results.

Hint: Remember that subtraction is the same as addition of a negative number.

a)  $100011 + 010101$

$$\begin{array}{r} 100011 \\ + 010101 \\ \hline 111000 \end{array} \rightarrow 56$$

No overflow condition

b)  $110000 - 000101$

$$\begin{array}{r} 110000 \\ - 000101 \\ \hline 101011 \end{array} \rightarrow 43$$

No overflow condition

c)  $110000 + 010010$

$$\begin{array}{r} 110000 \\ + 010010 \\ \hline 1000010 \end{array} \rightarrow 66$$

Overflow condition

d)  $101100 - 001110$

$$\begin{array}{r} 101100 \\ - 001110 \\ \hline 011110 \end{array} \rightarrow 30$$

No overflow condition