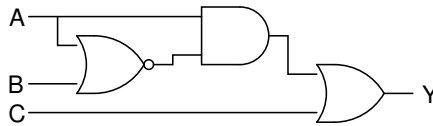


Review Exam 1

INEL 4205 - M. Toledo - January 2012

1. Let $M = 275$ and $N = 175$.
 - (a) Express in M and N in binary, octal, hexadecimal, and BCD.
 - (b) Add M and N using (i) binary, and (ii) BCD
 - (c) Use 10 bits and the 2's complement to
 - i. express $-M$ and $-N$
 - ii. add $+M$ and $-N$
 - iii. add $-M$ and $+N$
 - iv. convert your results to decimal and check them.
 - (d) Use the 1's complement to
 - i. express $-M$ and $-N$ using 10 bits
 - ii. add $+M$ and $-N$
 - iii. add $-M$ and $+N$
 - iv. convert your results to decimal and check them.
2. Determine the base of the following numbers for the following operations to be correct: (a) $14/2=5$, (b) $54/4 = 13$, (c) $24 + 17 = 40$.
3. Convert decimal 27.315 to binary, using up to 10 bits for the fractional part.
4. Write the truth tables for 3-input AND and OR gates.
5. The output y of a circuit with 3 inputs A , B and C must be logic-1 when the number of inputs equal to logic-1 is equal to two.
 - (a) Write the circuit's truth table.
 - (b) Use the 1's on the truth table to design the circuit.
 - (c) Write a boolean-algebra equation for y .
6. For the circuit sketched in the following diagram



Write:

- (a) the truth table
 - (b) the boolean algebra expression for Y .
7. Express the hexadecimal quantity ABC in octal and decimal.