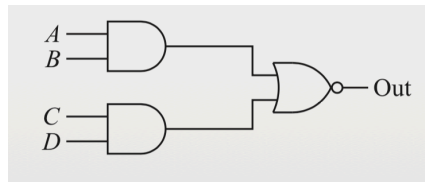


Phys2610 (2019) Assignment 6

Due 4 April 2019 (accepted until 9 April)

1. Use truth tables to prove that $A \cdot B = B \cdot A$ and $A \oplus B = A \cdot \bar{B} + B \cdot \bar{A}$.
2. Using diodes, npn transistors, and resistors, give an example of a circuit diagram for each of the following gates: (a) OR, (b) NOR, (c) AND, (d) NAND, and (e) NOT.
3. Draw a gate schematic to implement exclusive OR using only NAND gates.
4. Show the explicit diagram for a half adder using only NOR gates. Now show a schematic for a full adder using half adders and NOR gate(s).
5. Produce the truth table for the AND-OR-INVERT (AOI) gate shown below.



6. Using only NOR gates, produce a clocked flip-flop with the same functionality as the one below (from Section 8.9.2 of the text).

