CSE352 Autumn 2014 Homework #3

Due In Class Friday 10/24/2014

Please write your name and student ID at the top right corner of each page, and staple or paperclip your work together. We are NOT responsible for losing papers that were not stapled or paperclipped together.

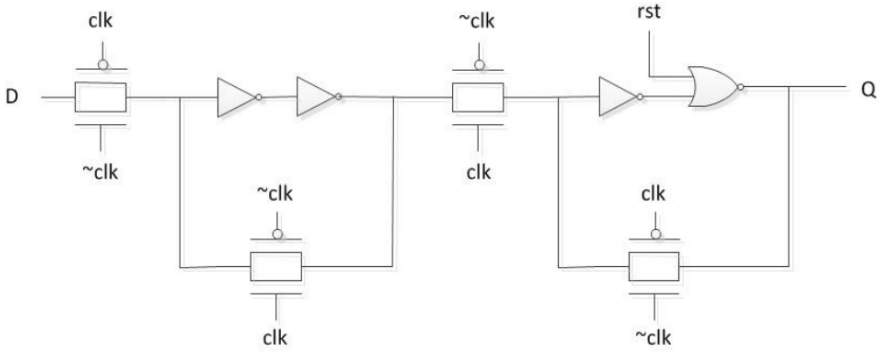
Complete the following questions. Please write legibly and try to draw clean diagrams. Spaghetti wiring in circuit diagrams is difficult to grade. We will not grade work that is too heavily encrypted for us to read (i.e. we can't read it, we can't grade it). Please consider typesetting your work if you think that it may not be legible to the grader. This is an individual assignment. You may not work in groups. Justice will be enforced if you are caught cheating.

Problem 1 *Multiplexer*

Julie needs to implement the function Y = $A\,\overline{B} + \overline{B}\,\overline{C} + A\,B\,\overline{C}$ for her senior project, but when she looks in her lab kit, the only part she has left is an 8:1 multiplexer. How does she implement the function?

Problem 2 *Flip Flops*

Ben Bitdiddle and Sylvia Shortcircuit are having an argument over how to implement an asynchronous reset to the following register using a signal rst. The asynchronous reset should immediately clear the value of the register and can be asserted for any period of time. He argues that the following modification is sufficient to implement the asynchronous reset:

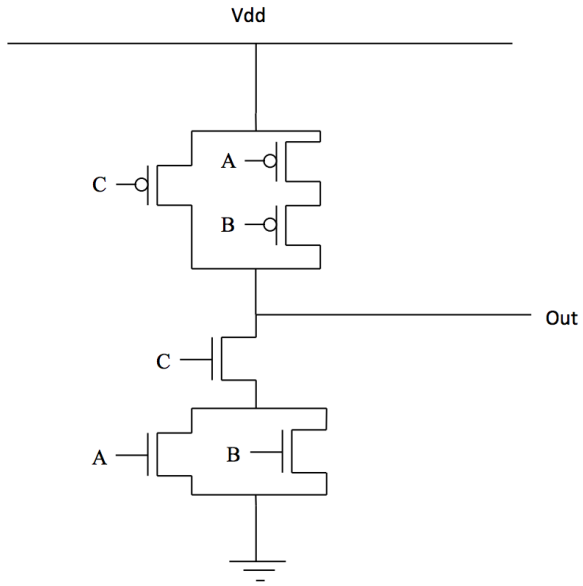


Sylvia Shortcircuit disagrees and argues that Ben's solution does not actually work and that it will fail for certain cases. Who is correct? If Ben's solution is indeed incorrect, under what circumstances would his implementation fail and how would you fix it?

Problem 3 *CMOS Circuits*

For each of the circuit given below, write down the boolean function it implements.

(a)



(b)