

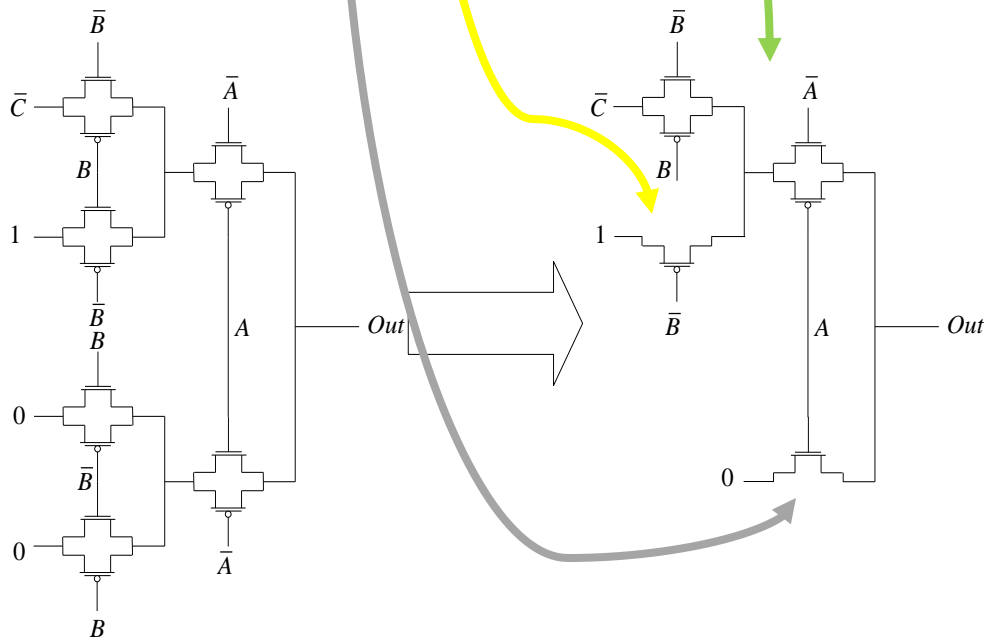
Solutions to HW2

(1) Flip-flop. PHI 1 and PHI2 are the two non-overlapping clocks

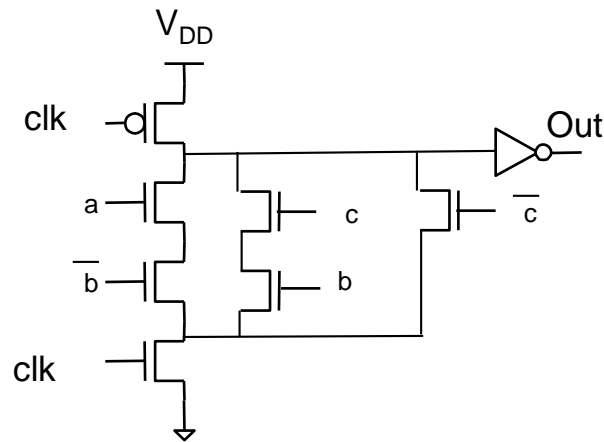
(2) Flip-flop. In principle it is same as the circuit of problem 1.

(3) $Out = \overline{(A+B+C)} + \bar{A}B = \bar{A}\bar{B}\bar{C} + \bar{A}B$

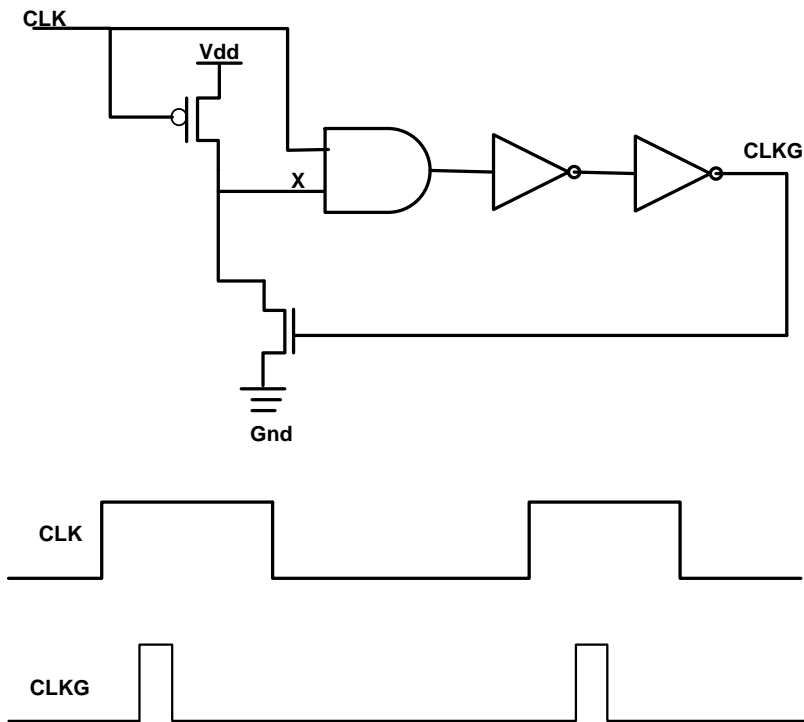
A	B	C	Out
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	0



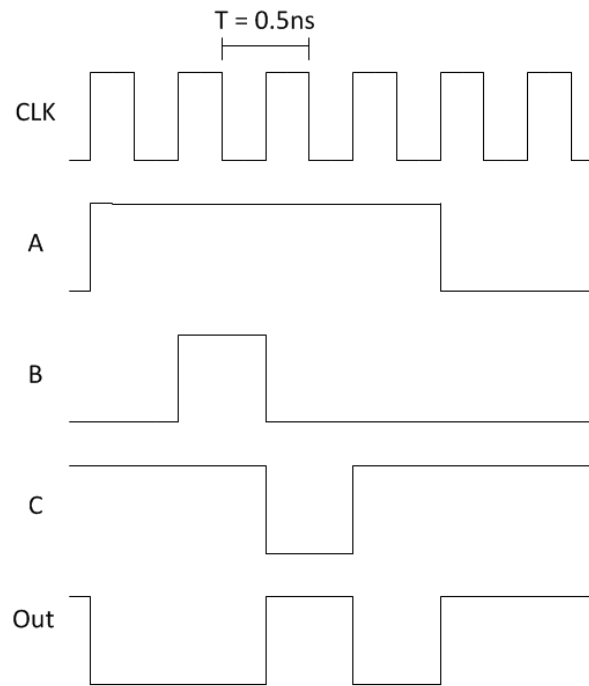
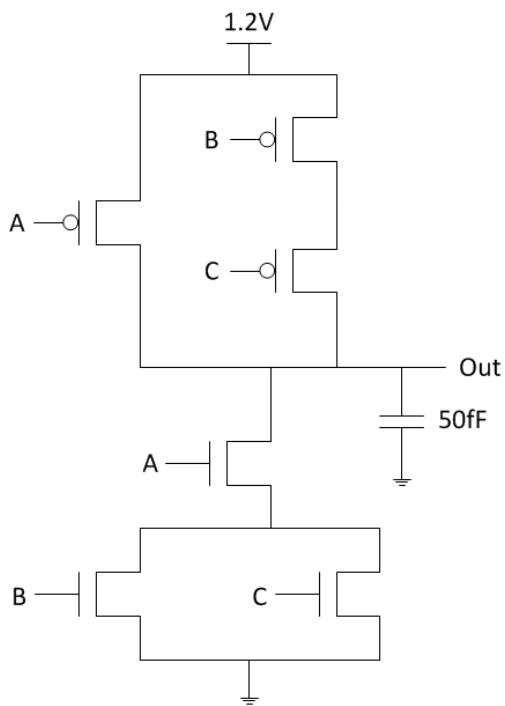
(4) $Out = A\bar{B} + BC + \bar{C}$



(5) CLKG will be a glitched clock.



(6)



$$P = \alpha CV^2f$$

$C = 50\text{fF}$, $V = 1.2\text{V}$,
 $f = 2\text{GHz}$, $\alpha = ?$

$$\alpha = (\text{\#toggles}/2)/\text{\#clockcycles} = (4/2)/6 = 1/3$$
$$P = 0.33 * 50\text{fF} * (1.2\text{V})^2 * 2\text{GHz} = 47.52\mu\text{W}$$