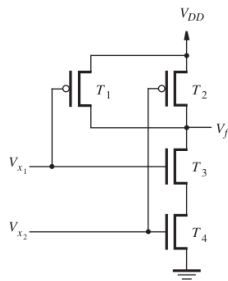


CMOS circuit review

Vikas Dhiman for ECE275

October 24, 2022

1 CMOS gate review

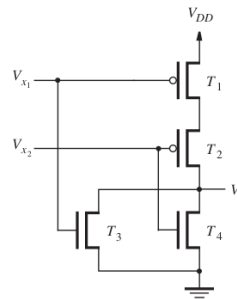


(a) Circuit

x_1	x_2	T_1	T_2	T_3	T_4	f
0	0	on	on	off	off	1
0	1	on	off	off	on	1
1	0	off	on	on	off	1
1	1	off	off	on	on	0

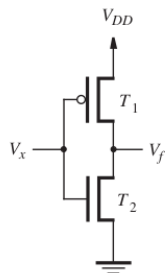
(b) Truth table and transistor states

CMOS NAND gate



x_1	x_2	T_1	T_2	T_3	T_4	f
0	0	on	on	off	off	1
0	1	on	off	off	on	0
1	0	off	on	on	off	0
1	1	off	off	on	on	0

CMOS NOR gate

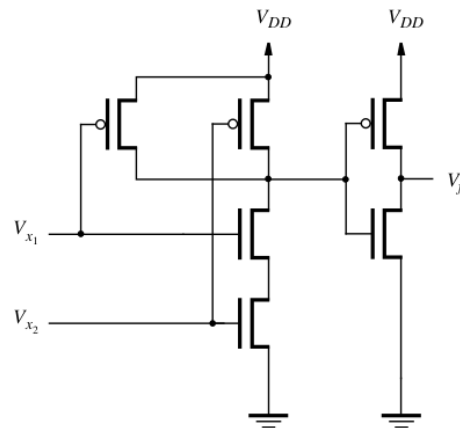


(a) Circuit

x	T_1	T_2	f
0	on	off	1
1	off	on	0

(b) Truth table and transistor states

CMOS NOT gate



CMOS AND gate

Example 1 Derive the CMOS complex gate that implements $f = \overline{x_1 x_2 + x_3 x_4 + x_5}$.

Problem 1 Derive the CMOS complex gate that implements $f = \bar{x}_1 \bar{x}_2 x_3 + \bar{x}_1 x_2 \bar{x}_3 + x_1 \bar{x}_2 \bar{x}_3 + x_1 x_2 x_3$.