ECE 320: Handout #19

Boolean Logic

Implement the following logic using NAND gates

Y   CD

		00	01	11	10
AB	00	1	0	1	1
	01	0	1	0	1
	11	x	x	x	x
	10	1	0	x	x

Implement the following logic using NOR gates

Y   CD

		00	01	11	10
AB	00	1	0	1	1
	01	0	1	0	1
	11	x	x	x	x
	10	1	0	x	x

Solutions

Implement the following logic using NAND gates

Y

CD

		00	01	11	10
AB	00	1	0	1	1
	01	0	1	0	1
	11	X	X	X	X
	10	1	0	X	X

$$Y = CD' + B'C + B'D' + BC'D$$
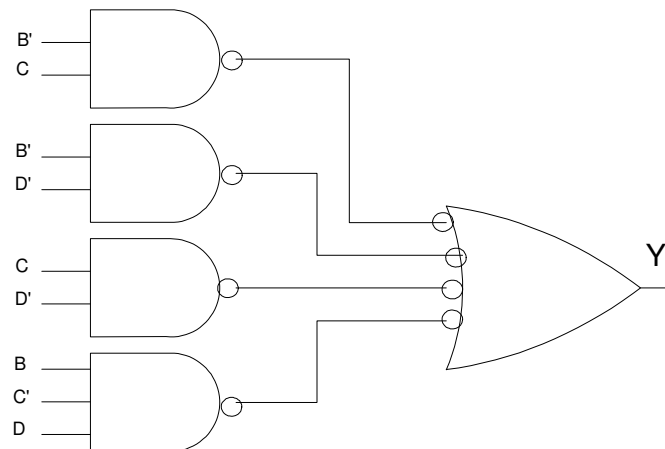
Solutions

Implement the following logic using NOR gates

Y   CD

		00	01	11	10
AB	00	1	0	1	1
	01	0	1	0	1
	11	x	x	x	x
	10	1	0	x	x

$$Y' = B'C'D + BC'D' + BCD$$

using DeMorgan's theorem

$$Y = (B + C + D')(B' + C + D)(B' + C' + D')$$