

19 - Porta Universal

a) NAND pode implementar

$$\text{NOT } A = A \text{ NAND } A$$

$$\text{AND} = (A \text{ NAND } B) \text{ NAND } (A \text{ NAND } B)$$

$$\text{OR} = (A \text{ NAND } A) \text{ NAND } (B \text{ NAND } B)$$

b) NOR também

$$\text{NOT } A = A \text{ NOR } A$$

$$\text{OR} = (A \text{ NOR } A) \text{ NOR } (B \text{ NOR } B)$$

$$\text{AND} = (A \text{ NOR } B) \text{ NOR } (A \text{ NOR } B)$$

20 - Circuito Combinado

$$S = (A \text{ XOR } B) \text{ NAND } (C \text{ XOR } D)$$

Tabela - Verdade

A	B	C	D	A	B	C XOR D
0	0	0	0	0	1	1
0	0	0	1	0	0	1
0	0	1	0	0	0	1
0	0	1	1	0	1	1
0	0	0	0	1	1	0
0	1	0	1	1	0	0
0	1	1	0	1	0	1
0	1	1	1	1	1	0
1	1	0	0	1	1	0
1	0	0	1	1	0	1
1	0	1	0	1	0	1
1	0	1	1	1	1	0
1	1	0	0	0	0	1
1	1	0	1	1	0	1
1	1	1	0	0	0	1
1	1	1	1	0	0	1