

Aula 05

Funções e portas Lógicas

Aula 05: Equivalência de Blocos Postulados

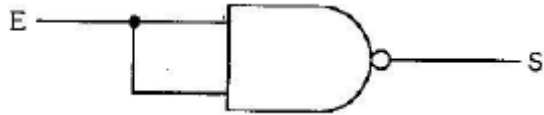
- Inversor a partir de uma porta NE
- Inversor a partir de uma porta NOU
- Portas NOU e OU a partir de E, NE e Inversores
- Portas NE e E a partir de OU, NOU e Inversor
- Postulados (da Complementação, Adição e Multiplicação
- Propriedades (Comutativa, Associativa e Distributiva)
- Teorema de Morgan
- Identidades Auxiliares

Lógica Digital

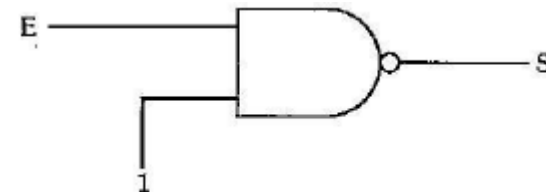
Inversor a partir de uma porta NE

- Tabela de uma porta NE

A	B	S
0	0	1
0	1	1
1	0	1
1	1	0



E	S
0	1
1	0

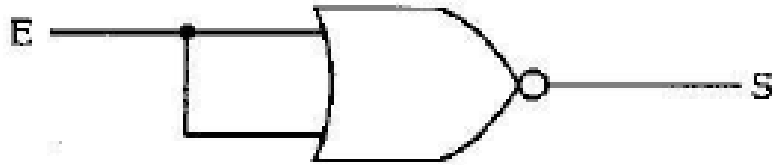


Lógica Digital

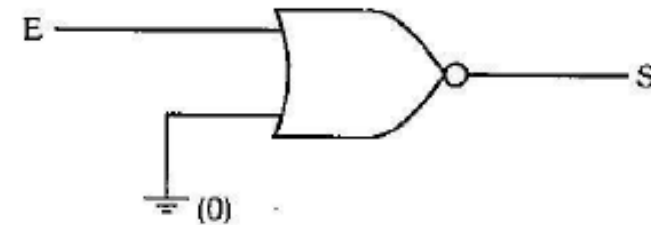
Inversor a partir de uma porta NOU

- Tabela de uma porta NOU

A	B	S
0	0	1
0	1	0
1	0	0
1	1	0



E	S
0	1
1	0

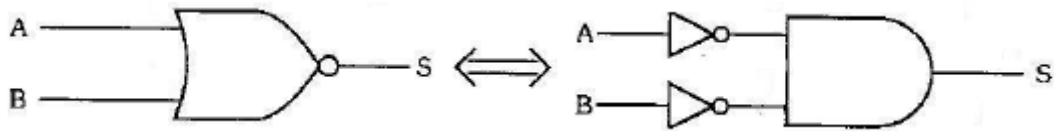


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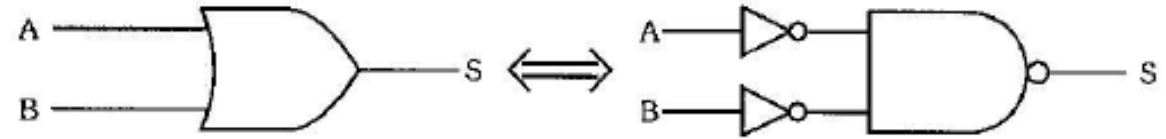
Portas NOU e OU a partir de E, NE e Inversores

- Teorema de Morgan $\rightarrow \overline{A + B} = \bar{A} \cdot \bar{B}$

A	B	$\overline{A + B}$	$\bar{A} \cdot \bar{B}$
0	0	1	1
0	1	0	0
1	0	0	0
1	1	0	0



- Com um inversor temos:



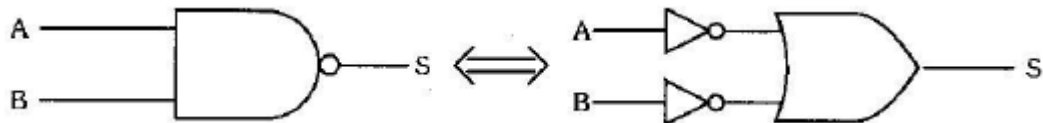
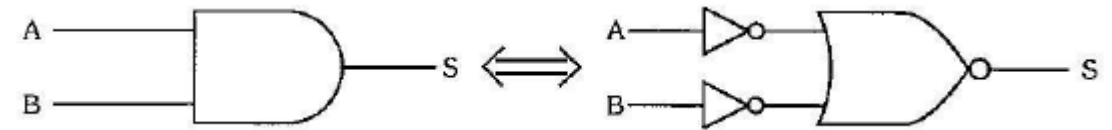
Lógica Digital

Portas NE e E a partir de OU, NOU e INVERSORES

- Teorema de Morgan $\rightarrow \overline{A \cdot B} = \overline{A} + \overline{B}$


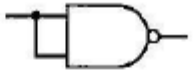




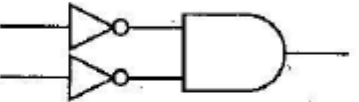

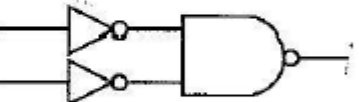

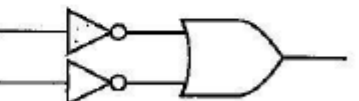

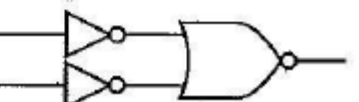
A	B	$\overline{A \cdot B}$	$\overline{A} + \overline{B}$
0	0	1	1
0	1	1	1
1	0	1	1
1	1	0	0

- Com um inversor temos:



Lógica Digital

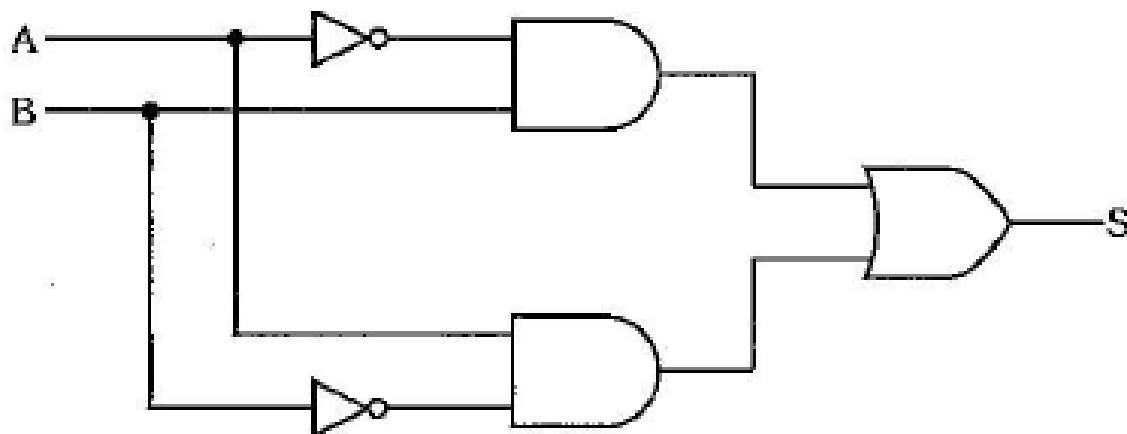
Quadro Resumo

BLOCO LÓGICO	BLOCO EQUIVALENTE
	   
	
	
	
	

Lógica Digital

Exercícios

1 - Desenhe o circuito OU Exclusivo, utilizando apenas portas NE.



2 - Desenhe o circuito que executa a expressão somente com portas NOU:

$$S = A + (B \odot C) \overline{(\overline{A} \cdot \overline{B} \cdot C)} + \overline{(\overline{A} \cdot \overline{C} + \overline{B})},$$