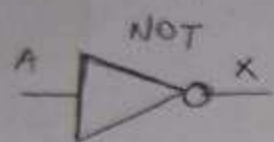


# Lista 3, Introdução à Sistemas de Informação

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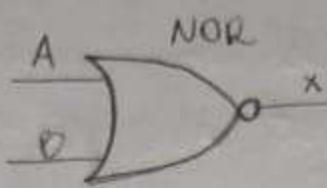
## ① Principais portas lógicas.



A	X
0	1
1	0



A	B	X
0	0	1
0	1	1
1	0	1
1	1	0



A	B	X
0	0	1
0	1	0
1	0	0
1	1	0



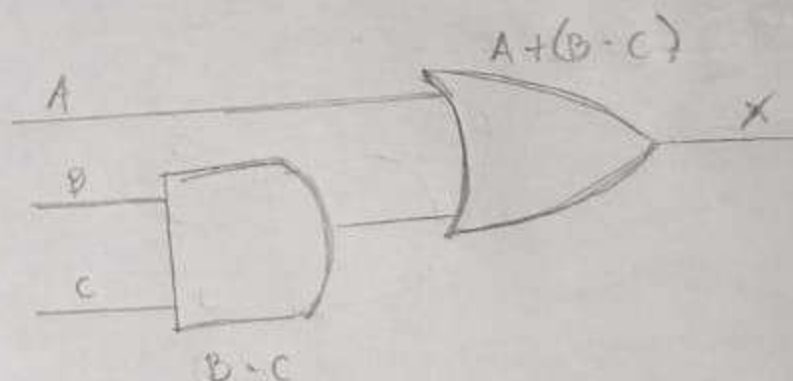
A	B	X
0	0	0
0	1	0
1	0	0
1	1	1



A	B	X
0	0	0
0	1	1
1	0	1
1	1	1

## ② Resultado de $A + (B \cdot C)$ e qual o circuito?

A	B	C	$B \cdot C$	$A + (B \cdot C)$
0	0	0	0	0
0	0	1	0	0
0	1	0	0	0
0	1	1	1	1
1	0	0	0	1
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1



## ③ Simplifique $A + (A \cdot B)$ sem usar tabela verdade.

$$A + (A \cdot B) \text{ Distributiva}$$

$$A \cdot 1 + (A \cdot B) \quad B + 1 = 1 \text{ para quaisquer valores de } B$$

$$A + (A \cdot B) = A \cdot 1 + (A \cdot B)$$

## ④ Simplifique $A \cdot (B + A)$

$$(A \cdot A) + (A \cdot B) \text{ Distributiva}$$

$$A + (A \cdot B) \text{ Identificação}$$

## ⑤ Mostre por que $(A + B)(A + C) = A + BC$

$$AA + AC + BA + BC$$

$$A + AC + AB + BC$$

$$A + A(C + B) + BC$$

$$A(1 + (C + B)) + BC$$

$$A(1) + BC$$

$$A + BC$$

Distributiva

$$BA = AB$$

Distributiva

Distributiva

Identificação

⑥ simplifique  $\bar{A} \cdot \bar{B} + \bar{A} \cdot B$

$$\bar{A}(\bar{B} + B)$$

$$\bar{A}(1)$$

$$\bar{A}$$

⑦ simplifique o circuito abaixo usando mapas de Karnaugh

A	B	C	$\bar{A}$	$\bar{B}$	$\bar{C}$	$\bar{A}BC$	$A\bar{B}C$	$AB\bar{C}$	$ABC$	S
0	0	0	1	1	1	0	0	0	0	0
0	0	1	1	1	0	0	0	0	0	0
0	1	0	1	0	1	0	0	0	0	1
0	1	1	1	0	0	1	0	0	0	0
1	0	0	0	1	1	0	0	0	0	0
1	0	1	0	1	0	0	1	0	0	1
1	1	0	0	0	1	0	0	1	0	1
1	1	1	0	0	0	0	0	0	1	1

A	B	$\bar{B}C$	$BC$	$B\bar{C}$
-	00	01	11	10
0	0	0	1	0
1	0	1	1	1

$$S = AC + BC + AB$$

⑧ ...

$$S_1 = A + B + C$$

A	B	C	$S_1$
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

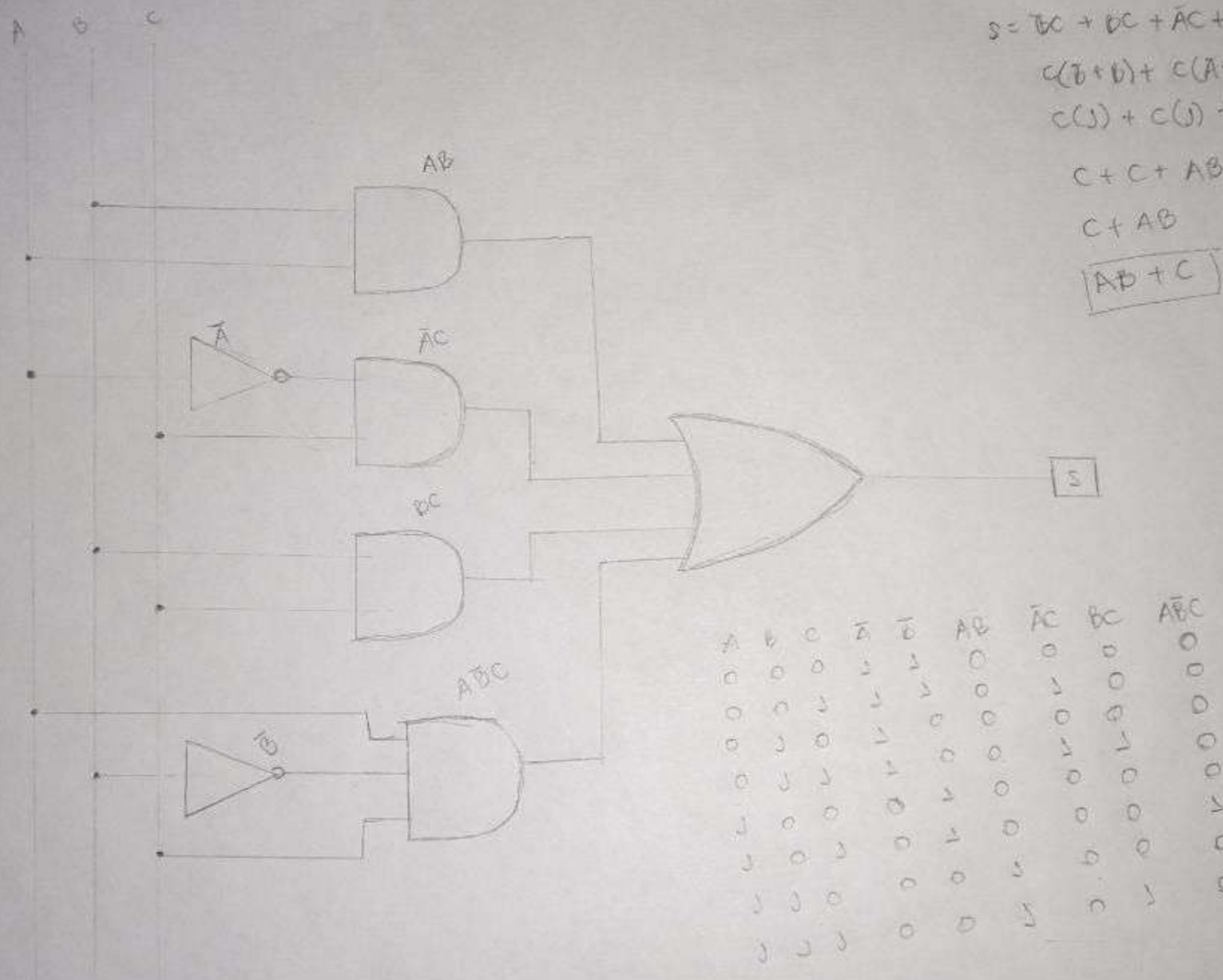
A \ BC	00	01	11	10
0	0	1	1	1
1	1	1	1	1

⑨





Q30)  $S = A \cdot B + \bar{A} \cdot C + B \cdot C + A \cdot \bar{B} \cdot C$



$$\begin{aligned}
 S &= \bar{B}C + BC + \bar{A}C + AC + AB \\
 &= C(\bar{B} + B) + C(A + \bar{A}) + AB \\
 &= C(1) + C(1) + AB \\
 &= C + C + AB \\
 &= C + AB \\
 &= \boxed{AB + C}
 \end{aligned}$$

A	B	C	$\bar{A}$	$\bar{B}$	AB	$\bar{A}C$	BC	$A\bar{B}C$	S
0	0	0	1	1	0	0	0	0	0
0	0	1	1	1	0	1	0	0	1
0	1	0	1	0	0	0	0	0	0
0	1	1	1	0	0	0	1	0	1
1	0	0	0	1	0	0	0	0	0
1	0	1	0	1	0	0	0	1	1
1	1	0	0	0	1	0	0	0	1
1	1	1	0	0	1	0	1	1	1

