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Atividade 3

3.10.1 - Simplifique cada expressão, utilizando a Álgebra de Boole.

a) $S = AB\bar{C} + \bar{A}\bar{B}C + AB C + \bar{A}BC + \bar{A}B\bar{C}$

$S = B(\bar{A}\bar{C} + \bar{A}C + A\bar{C} + AC) + \bar{B}\bar{A}C$

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

$S = B(\bar{A}\cdot 1 + A\cdot 1) + \bar{B}\bar{A}C$

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

$S = B\cdot 1 + \bar{B}\bar{A}C$

$S = B + \bar{B}\bar{A}C$

$S = B + \bar{A}C \; *$

b) $S = AB\bar{C}D + \bar{A}\bar{B}C\bar{D} + AB\bar{C}\bar{D} + \bar{A}BC\bar{D} + ABC\bar{D} + A\bar{B}C\bar{D} + ABCD$

$S = [A(B\bar{C}D + B\bar{C}\bar{D} + BC\bar{D} + \bar{B}C\bar{D} + BCD)] + [\bar{A}(BC\bar{D} + BC\bar{D})]$

$S = A(B(\bar{C}\bar{D} + \bar{C}D + C\bar{D} + CD) + \bar{B}C\bar{D}) + \bar{A}(\bar{B}C\bar{D} + BC\bar{D})$

$S = A(B + \bar{B}C\bar{D}) + \bar{A}C\bar{D}$

$S = A(B + C\bar{D}) + \bar{A}C\bar{D}$

$S = AB + [AC\bar{D} + \bar{A}C\bar{D}] + C(A\bar{D} + \bar{A}\bar{D})$

$S = AB + C\bar{D} \; \#$

$C(\bar{B}\bar{D} + B\bar{D})$

$C(\bar{D}(\bar{B} + \bar{B}))$

$C(\bar{D})$

$C(\bar{D}(A + \bar{A})$

$C(\bar{D}\cdot 1)$

$C\bar{D}$

3.10.9 - Através dos diagramas de Vuitch-Karnaugh, determine a expressão simplificada de S_1 e S_2 da Tabela 3.26.

A	B	S_1	S_2
0	0	1	1
0	1	0	1
1	0	1	0
1	1	1	0

	$\bar{B}$	B
$\bar{A}$	1	0
A	1	1

$S_1 = \bar{B} + A$

	$\bar{B}$	B
$\bar{A}$	1	1
A	0	0

$S_2 = \bar{A}$

3.10.10 - Simplifique as expressões S_1, S_2, S_3 e S_4 da Tabela 3.27, utilizando os mapas de Vuitch-Karnaugh.

A	B	C	S_1	S_2	S_3	S_4
0	0	0	1	1	0	0
0	0	1	0	1	1	1
0	1	0	1	1	0	1
0	1	1	1	0	0	0
1	0	0	1	1	1	1
1	0	1	1	1	1	0
1	1	0	0	1	1	1
1	1	1	1	0	0	1

	$\bar{B}$		B	
$\bar{A}$	1	0	1	1
A	1	1	1	0
	$\bar{C}$	C		$\bar{C}$

$S_1 = A\bar{B} + BC + A\bar{C}$ ✳

	$\bar{B}$		B	
$\bar{A}$	1	1	0	1
A	1	1	0	1
	$\bar{C}$	C		$\bar{C}$

$S_2 = \bar{B} + \bar{C}$ ✳

	$\bar{B}$		B	
$\bar{A}$	0	1	0	1
A	1	0	1	1
	$\bar{C}$	C		$\bar{C}$

$S_4 = \bar{A}\bar{B}C + A\bar{C} + AB + B\bar{C}$ ✳

	$\bar{B}$		B	
$\bar{A}$	0	1	0	0
A	1	1	0	1
	$\bar{C}$	C		$\bar{C}$

$S_3 = \bar{B}C + A\bar{C}$ ✳

3.10.14. Simplifique as expressões de S_1 e S_2 da Tabela 3.30.

A	B	C	S_1	S_2
0	0	0	X	1
0	0	1	0	X
0	1	0	1	0
0	1	1	X	0
1	0	0	1	0
1	0	1	X	1
1	1	0	X	X
1	1	1	1	X

$$S_1 = A + B + \bar{C}$$

$$S_2 = \bar{A}\bar{B} + AC$$