

PROVA 01 REFEITA

Ludmily Caldeira da Silva - 417290

1) a)

	a	b	c	d	S2	S1	S0
0	0	0	0	0	0	0	0
1	0	0	0	1	0	0	1
2	0	0	1	0	0	0	1
3	0	0	1	1	0	1	0
4	0	1	0	0	0	0	1
5	0	1	0	1	0	1	0
6	0	1	1	0	0	1	0
7	0	1	1	1	0	1	1
8	1	0	0	0	0	0	1
9	1	0	0	1	0	1	0
10	1	0	1	0	0	1	0
11	1	0	1	1	0	1	1
12	1	1	0	0	0	1	0
13	1	1	0	1	0	1	1
14	1	1	1	0	0	1	1
15	1	1	1	1	1	0	0

$$b) s_0 = \sum m(1, 2, 4, 7, 8, 11, 13, 14) =$$

$$(a'b'c'd) + (a'b'c'd') + (a'b'c'd') + (a'b'c'd) + (a'b'c'd') + (a'b'c'd) + (a'b'c'd) + (a'b'c'd')$$

$$c) s_1 = \sum m(3, 5, 6, 7, 9, 10, 11, 12, 13, 14)$$

$$d) s_0 = \prod M(0, 3, 5, 6, 9, 10, 12, 15) =$$

$$(A+B+C+D) (A+B+C'+D') (A+B'+C+D') (A+B'+C'+D) (A'+B+C+D') (A'+B+C'+D) (A'+B'+C+D) (A'+B'+C'+D)$$

e)

$$S_0 = (a'b'c'd) + (a'b'c'd') + (a'b'c'd') + (a'b'c'd) + (a'b'c'd') + (a'b'c'd) + (a'b'c'd) + (a'b'c'd')$$

ab	cd	cd	cd	cd
00	0	1	0	1
01	1	0	1	0
11	0	1	0	1
10	1	0	1	0

$$f) s_0 = (a'b'c'd) + (a'b'c'd') + (a'b'c'd') + (a'b'c'd) + (a'b'c'd') + (a'b'c'd) + (a'b'c'd) + (a'b'c'd')$$

$$= a'b'(c'd + c'd') + b'd(a'c + a'c') + c'd'(a'b + a'b') + a'c(b'd + b'd')$$

$$= a'b'(c \wedge d) + b'd(a \wedge c) + c'd'(a \wedge b) + a'c(b \wedge d)$$

$$g) s_1 = \sum m(3, 5, 6, 7, 9, 10, 11, 12, 13, 14)$$

GRUPOS
2 bits
3 – 0011
5 – 0101
6 – 0110
9 – 1001
10 – 1010
3 bits
7 – 0111
11 – 1011
13 – 1101
14 – 1110

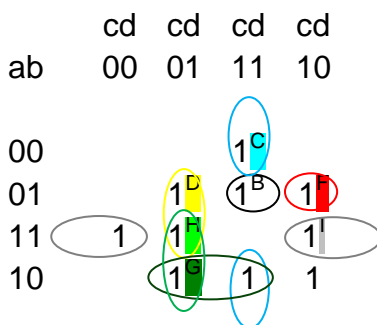
GRUPO DE 2 TERMOS
(3, 7) 0_11 A
(3, 11) _011 B
(5, 13) _101 C
(6, 7) 011_ D
(9, 11) 10_1 E
(9, 13) 1_01 F
(10, 11) 101_ G
(12, 13) 110_ H
(12, 14) 11_0 I

	3	5	6	7	9	10	11	12	13	14
A	X									
B	X						X			
C		X							X	
D			X	X						
E					X		X			
F					X				X	
G						X	X			
H								X	X	
I								X		X

$$S1 = B + C + D + F + G + H + I$$

$$= (a'c'd) + (b'c'd) + (b'c'd) + (a'b'c) + (a'b'd) + (a'c'd) + (a'b'c) + (a'b'c') + (a'b'd')$$

h)



$$\begin{aligned}
 \text{i) } S1 &= (a'c'd) + (b'c'd) + (b'c'd) + (a'b'c) + (a'b'd) + (a'c'd) + (a'b'c) + (a'b'c') + (a'b'd') \\
 &= (a'c'd) + (a'c'd) + (b'c'd) + (b'c'd) + (a'b'c) + (a'b'c) + (a'b'c') + (a'b'd') + (a'b'd') \\
 &= d(a'c + a'c') + d(b'c + b'c') + c(a'b + a'b') + a(b'd' + b'd') \\
 &= d(a^c) + d(b^c) + c(a^b) + a(b^d)
 \end{aligned}$$

j) $s_2 = \sum m(15) = abcd$

module s2 (s, a, b, c, d);

input a, b, c, d;

output s;

and AND1 (s, a, b, c, d);

endmodule