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) s0 = ∑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) s1 = ∑m (3, 5, 6, 7, 9, 10, 11, 12, 13, 14)

d) s0 = ∏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)

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

S0 = (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')

f) s0 = (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 ^ d) + b d(a ^ c) + c'd'(a ^b) + a c(b ^d)

g) s1 = ∑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			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)

	cd	cd	cd	cd
ab	00	01	11	10
00			1 C	
01		1 D	1 B	1 F
11	1	1 H		1 I
10		1 G	1	1

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)

j) s2 = $\sum m\ (15)$ = abcd

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

input a, b, c, d;

output s;

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

endmodule
```