DOCUMENTAÇÃO

EXERCÍCIO 1

FAZER um circuito lógico para a função abaixo,após simplificá-la pelo método de Quine-McCluskey:

f (a, b, c, d) = SoP (m(2, 3, 6, 7, 10, 11, 12, 14))

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

1 bit

2 0010

2 bits

3 0011
6 0110
10 1010
12 1100

3 bits

7 0111
11 1011
14 1110

Grupos(2)

(2 , 3) 001_
(2, 6) 0_10
(2, 10) _010
(3, 7) 0_11
(3,11) _011
(6, 7) 011_
(6, 14) _110
(10, 11) 101_
(10, 14) 1_10
(12, 14) 11_0

Organizado

(2 , 3) 001_
(6, 7) 011_
(10, 11) 101_

(12, 14) 11_0 A

(2, 10) _010
(3,11) _011
(6, 14) _110

(2, 6) 0_10
(3, 7) 0_11
(10, 14) 1_10

Grupo(4)

(02 , 10 , 03 , 11) _ 0 1 _
(02 , 10 , 06 , 14) _ _ 1 0
(02 , 06 , 03 , 07) 0 _ 1 _
(02 , 06 , 10 , 14) _ _ 1 0
(02 , 03 , 06 , 07) 0 _ 1 _
(02 , 03 , 10 , 11) _ 0 1 _

Organizado

(02 , 10 , 06 , 14) _ _ 1 0
(02 , 06 , 10 , 14) _ _ 1 0

(02 , 10 , 03 , 11) _ 0 1 _
(02 , 03 , 10 , 11) _ 0 1 _

(02 , 06 , 03 , 07) 0 _ 1 _
(02 , 03 , 06 , 07) 0 _ 1 _

Simplificando

(02 , 06 , 10 , 14) _ _ 1 0 B
(02 , 03 , 10 , 11) _ 0 1 _ C
(02 , 03 , 06 , 07) 0 _ 1 _ D

	2	3	6	7	10	11	12	14
A							X	X
B	X		X		X			X
C	X	X			X	X		
D	X	X	X	X				

FUNÇÃO: S = A + B + C + D

S = abd' + cd' + b'c + a'c

EXERCÍCIO 2

FAZER um circuito lógico para a função abaixo, após simplificá-la pelo método de Quine-McCluskey:

f (a, b, c, d) = SoP (m(0, 2, 4, 8, 9, 11, 13))

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

0 bit

0 0000

1 bit

2 0010
4 0100
8 1000

2 bits

9 1001

3 bits

11 1011
13 1101

Grupos(2)

(0,2) 00_0 **A**
(0, 4) 0_00 **B**
(0, 8) _000 **C**
(8, 9) 100_ **D**
(9,11) 10_1 **E**
(9, 13) 1_01 **F**

	0	2	4	8	9	11	13
A	x	x					
B	x		x				
C	x			x			
D				x	x		
E					x	x	
F					x		x

Simplificando D, temos a função

FUNÇÃO: S = A + B + C + E + F
S = a'b'd'+ a'c'd' + b'c'd' + ab'd + ac'd

EXERCICIO 3

Dados os mapas de Karnaugh abaixo para as entradas (a, b, c, d, e) respectivamente

```
a=0\de 00 01 11 10      a=1\de 00 01 11 10
 bc                      bc
 00     1  1             00        1     1
 01     1  1  1          01     1  1  1
 11        1  1  1       11        1  1  1
 10     1  1             10           1
```

Implementar o circuito simplificado por Quine-McCluskey.

	a	b	c	d	e
0	0	0	0	0	0
1	0	0	0	0	1
2	0	0	0	1	0
3	0	0	0	1	1
4	0	0	1	0	0
5	0	0	1	0	1
6	0	0	1	1	0
7	0	0	1	1	1
8	0	1	0	0	0
9	0	1	0	0	1
10	0	1	0	1	0
11	0	1	0	1	1
12	0	1	1	0	0
13	0	1	1	0	1
14	0	1	1	1	0
15	0	1	1	1	1
16	1	0	0	0	0
17	1	0	0	0	1
18	1	0	0	1	0
19	1	0	0	1	1
20	1	0	1	0	0
21	1	0	1	0	1
22	1	0	1	1	0
23	1	0	1	1	1
24	1	1	0	0	0
25	1	1	0	0	1
26	1	1	0	1	0
27	1	1	0	1	1
28	1	1	1	0	0
29	1	1	1	0	1
30	1	1	1	1	0
31	1	1	1	1	1

0 bit

0	00000

1 bit

1	00001
4	00100
8	01000

2 bits

5	00101
9	01001
17	10001
18	**10010 A**
20	10100

3 bits

7	00111
13	01101
14	01110
21	10101

4 bits

15	01111
23	10111
27	11011
29	11101
30	11110

5 bits

31	11111

Grupos(2)

(0, 1)	0000_	(5, 13)	0_101	(14, 30)	_1110
(0, 4)	00_00	(5, 21)	_0101	(21, 23)	101_1
(0, 8)	0_000	(9, 13)	01_01	(21, 29)	1_101
(1, 5)	00_01	(17, 21)	10_01	(15, 31)	_1111
(1, 9)	0_001	(20, 21)	1010_	(23, 31)	1_111
(1, 17)	_0001	(7, 15)	0_111	(27, 31)	11_11
(4, 5)	0010_	(7, 23)	_0111	(29, 31)	111_1
(4, 20)	_0100	(13, 15)	011_1	(30,31)	1111_
(8, 9)	0100_	(13, 29)	_1101		
(5, 7)	001_1	(14,15)	0111_		

Organizado

(0, 1)	0000_	(5, 7)	001_1	(0, 4)	00_00	(0, 8)	0_000
(4, 5)	0010_	(13, 15)	011_1	(1, 5)	00_01	(1, 9)	0_001
(8, 9)	0100_	(21, 23)	101_1	(9, 13)	01_01	(5, 13)	0_101
(20, 21)	1010_	(29, 31)	111_1	(17, 21)	10_01	(7, 15)	0_111
(14,15)	0111_			**(27, 31)**	**11_11 B**	(21, 29)	1_101
(30,31)	1111_					(23, 31)	1_111

(1, 17)	_0001
(4, 20)	_0100
(5, 21)	_0101
(7, 23)	_0111
(13, 29)	_1101
(14, 30)	_1110
(15, 31)	_1111

Grupo (4)

(0, 1, 4, 5)	**00_0_ C**	**(5, 7, 21, 23)**	**_01_1 I**
(0, 4, 1, 5)	00_0_	(5, 21, 7, 23)	_01_1
(0, 1, 8, 9)	**0_00_ D**	**(5, 13, 21, 29)**	**_ _101 J**
(0, 8, 1, 9)	0_00_	(5, 21, 13, 29)	_ _ 101
(1, 5, 9, 13)	**0_ _01 E**	**(7, 23, 15, 31)**	**_ _111 K**
(9, 13, 1, 5)	0_ _01	(15, 31, 7 23)	_ _111
(1, 5, 17, 21)	**_0_01 F**	**(13, 15, 29, 31)**	**_11_1 L**
(1, 17, 5, 21)	_0_01	(13, 29, 15, 31)	_11_1
(4, 5, 20, 21)	**_010_ G**	**(14, 15, 30, 31)**	**_111_ M**
(4, 20, 5, 21)	_010_	(14, 30, 15, 31)	_111_
(5, 13, 7, 15)	**0_1_1 H**	**(21, 23, 29, 31)**	**1_1_1 N**
(5, 7, 13, 15)	0_1_1	(21, 29, 23, 31)	1_1_1

	0	1	4	5	7	8	9	13	14	15	17	18	20	21	23	27	29	30	31
A												x							
B																x			x
C	x	x	x	x															
D	x	x				x	x												
E		x		x			x	x											
F		x		x							x			x					
G				x	x								x	x					
H				x	x			x		x									
I				x	x									x	x				
J				x				x						x			x		
K					x					x					x				x
L								x		x							x		x
M									x	x								x	x
N														x	x		x		x

Simplificações: C, E, H, I, J, N

FUNÇÃO: S = A + B + D + F + G + K + L + M

S = ab'c'de' + abde + a'c'd' + b'd'e + b'cd' + cde + bce + bcd