Notas de Aulas

Lógica para Computação I

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SISTEMAS DICOTÔMICOS

O mundo em que vivemos apresenta situações com dois estados apenas, algumas das quais tabelamos a seguir:

1	0
sim	não
dia	noite
preto	branco
verdadeiro	falso
ligado	desligado

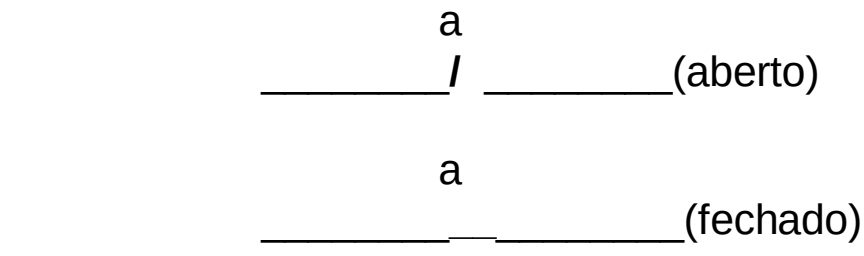
Aplicações da lógica para análise dos circuitos.

INTERRUPTOR

Um dispositivo ligado a um ponto de um circuito elétrico que pode assumir 2 estados:

- fechado (1) ou (V)

- aberto (0) ou (F)



(aberto)

(fechado)

Representado por _____a_____

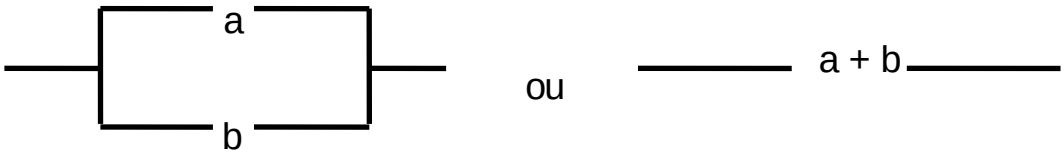
a=1 fechado

a=0 aberto

Negação - denomina-se por a' - aberto qdo **a** está fechado
- fechado qdo **a** está aberto

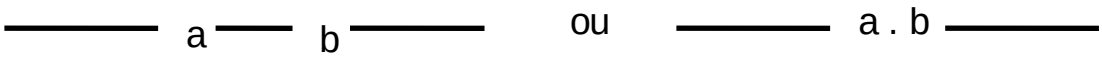
a	a'
0	1
1	0

EM PARALELO:



Só passará corrente se um dos interruptores estiver fechado, isto é, qdo a=1 **ou** b=1.

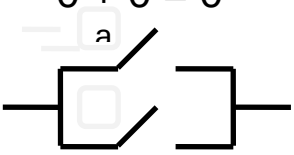
EM SÉRIE:



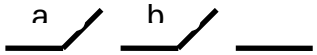
Só passará corrente se os interruptores estiverem fechados, isto é, a=b=1.

fechado (1)	paralelo (+)
aberto (0)	série (.)

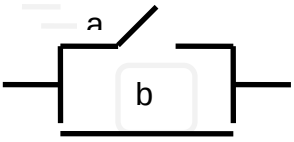
0 + 0 = 0



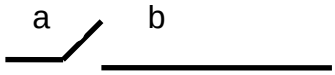
0 . 0 = 0



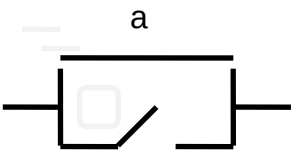
0 + 1 = 1



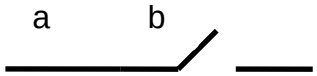
0 . 1 = 0



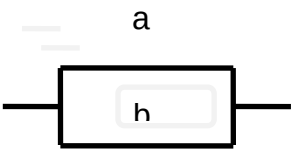
1 + 0 = 1



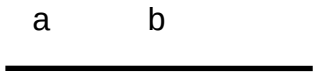
1 . 0 = 0



1 + 1 = 1



1 . 1 = 1



a + b = b + a

a . b = b . a

0 + 0 = 0 + 0 = 0

0 . 0 = 0 . 0 = 0

0 + 1 = 1 + 0 = 1

0 . 1 = 1 . 0 = 0

$1 + 0 = 0 + 1 = 1$	$1 \cdot 0 = 0 \cdot 1 = 0$
$1 + 1 = 1 + 1 = 1$	$1 \cdot 1 = 1 \cdot 1 = 1$
$a + a' = 1$	$a \cdot a' = 0$
$a + 0 = a$	$a \cdot 0 = 0$
$a + 1 = 1$	$a \cdot 1 = a$

Exercícios:

1) Desenhar os circuitos cujas ligações são dadas pelas expressões:

a) $p \cdot (q + r)$

b) $m + (p'. q' \cdot r')$

c) $m + n + p + q$

d) $(x \cdot y) + (x'. z)$

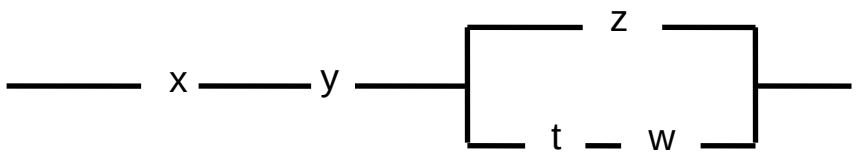
e) $(x'. y) + (x \cdot y')$

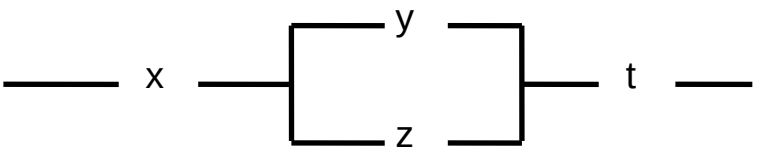
f) $x'. (y + x) \cdot y'$

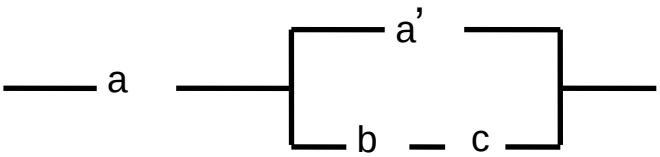
g) $(p + q) \cdot (p' + q')$

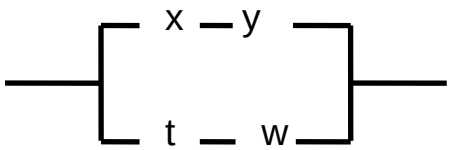
h) $(p + q) \cdot (p + q' + r')$

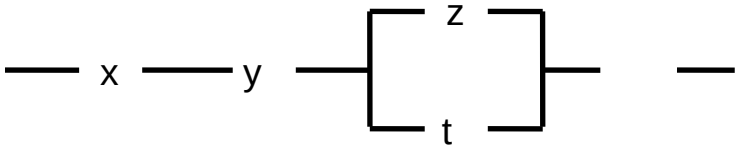
2) Dar as expressões dos circuitos desenhados:

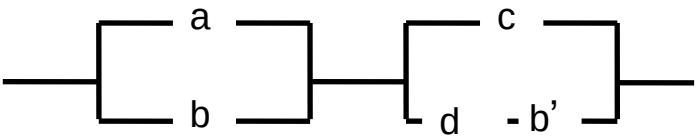
a) 

b) 

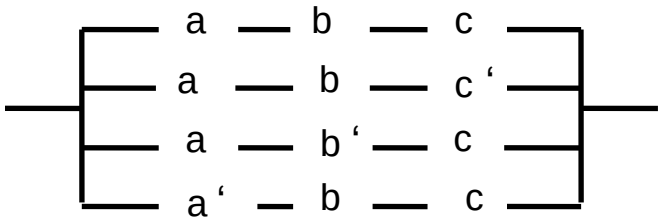
c) 

d) 

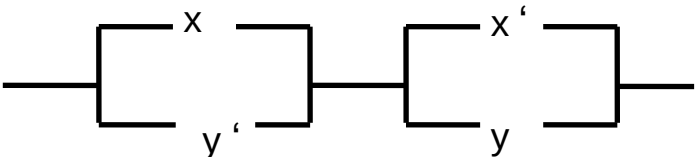
e) 

f) 

g)



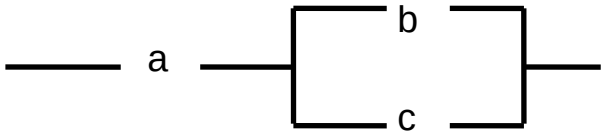
h)



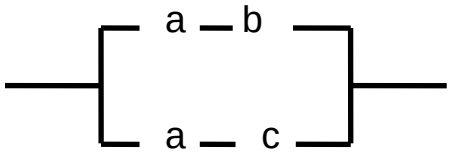
3) Dar as expressões dos interruptores:

1)

a)



b)



Qdo eles estão abertos?

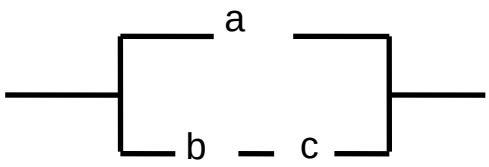
a) b)

Qdo eles estão fechados?

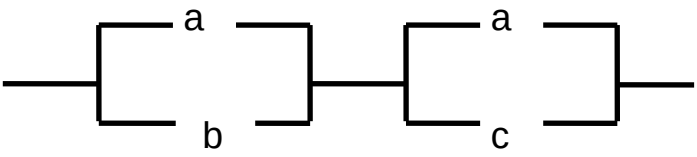
a) b)

2)

a)



b)



Qdo ambos estão abertos?

a) b)

Qdo ambos estão fechados?

a) b)