SEL0414 - Sistemas Digitais

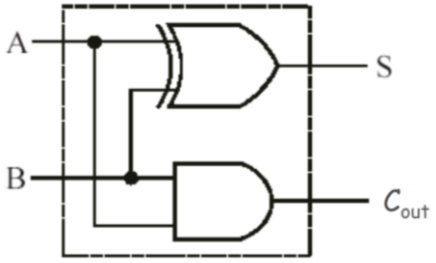
Resolução Lista 10 - Circuitos Aritméticos

01.

A	B	S	C_{out}
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

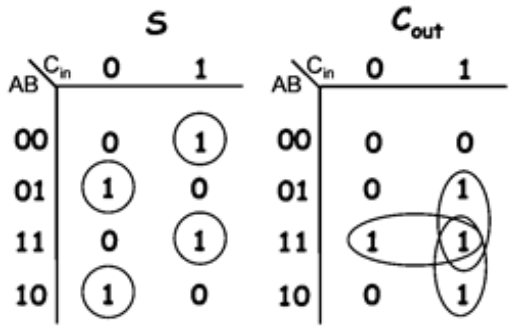
$S = \bar{A}B + A\bar{B} = A \oplus B$

$C_{out} = AB$



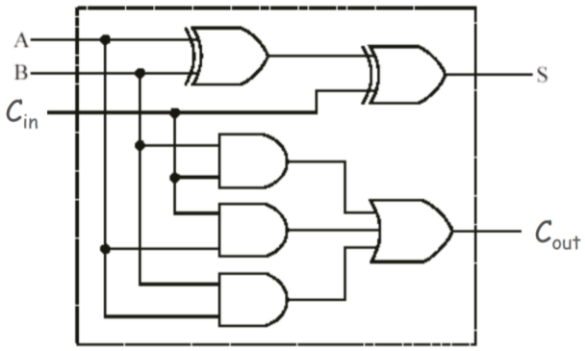
02.

A	B	C_{in}	S	C_{out}
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1



$S = A \oplus B \oplus C_{in}$

$C_{out} = AB + AC_{in} + BC_{in}$



03.

A	B	T_{in}	S	T_{out}
0	0	0	0	0
0	0	1	1	1
0	1	0	1	1
0	1	1	0	1
1	0	0	1	0
1	0	1	0	0
1	1	0	0	0
1	1	1	1	1

S

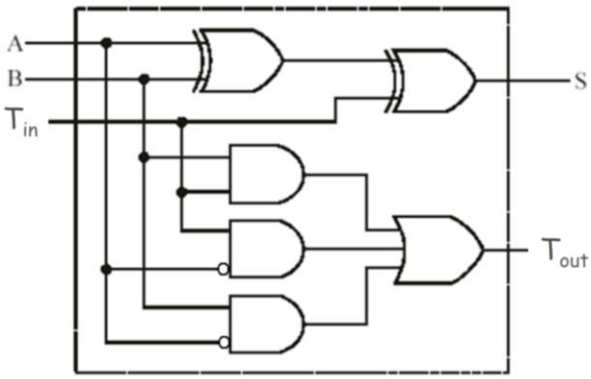
AB \ T_{in}	0	1
00	0	1
01	1	0
11	0	1
10	1	0

T_{out}

AB \ T_{in}	0	1
00	0	1
01	1	1
11	0	1
10	0	0

$$S = A \oplus B \oplus T_{in}$$

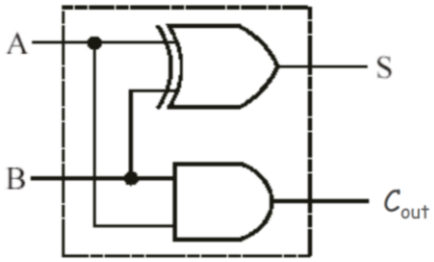
$$T_{out} = \overline{A}B + \overline{A}T_{in} + BT_{in}$$



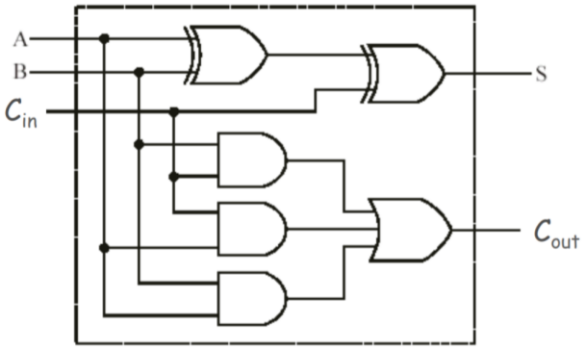
04.

O somador completo utiliza o carry vindo de operações anteriores, enquanto o meio somador faz a soma apenas com os bits de entrada

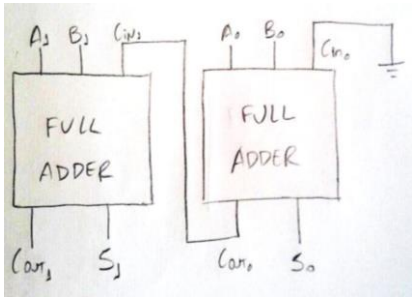
Meio somador :



Somador completo:



05.



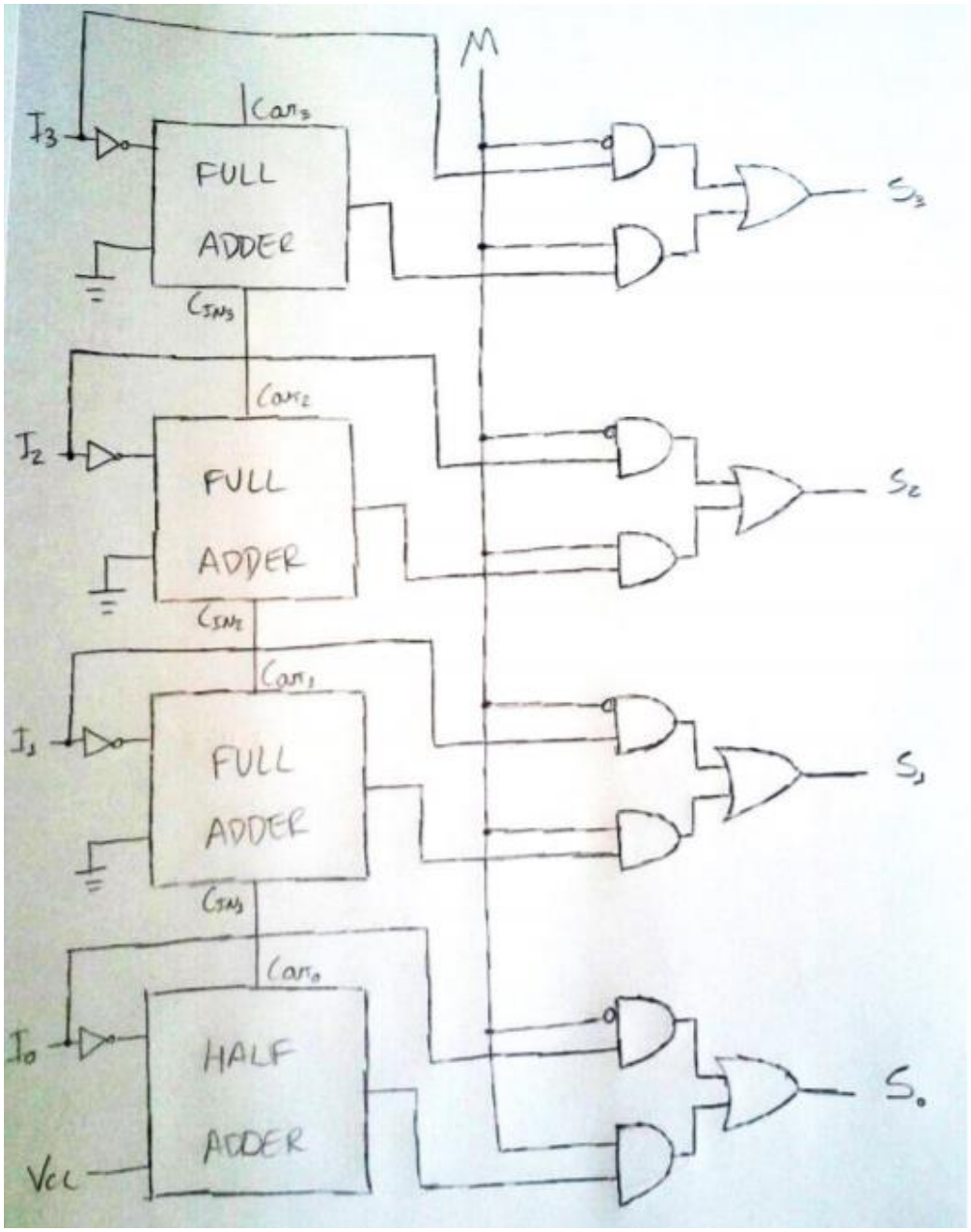
06.

M	I	S
0	0	0
0	1	1
1	0	1
1	1	0

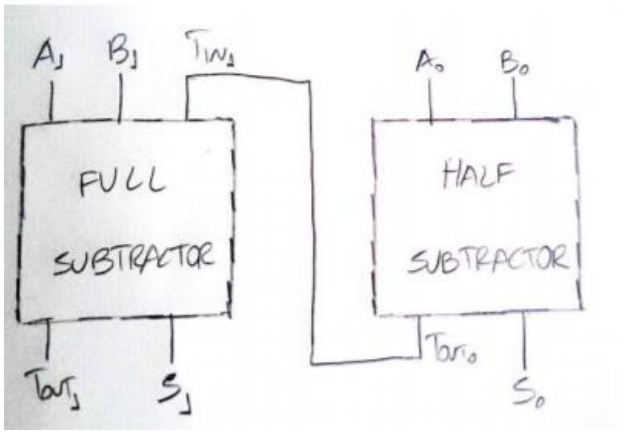
$$S = \bar{M}I + M\bar{I} = M \oplus I$$

07.

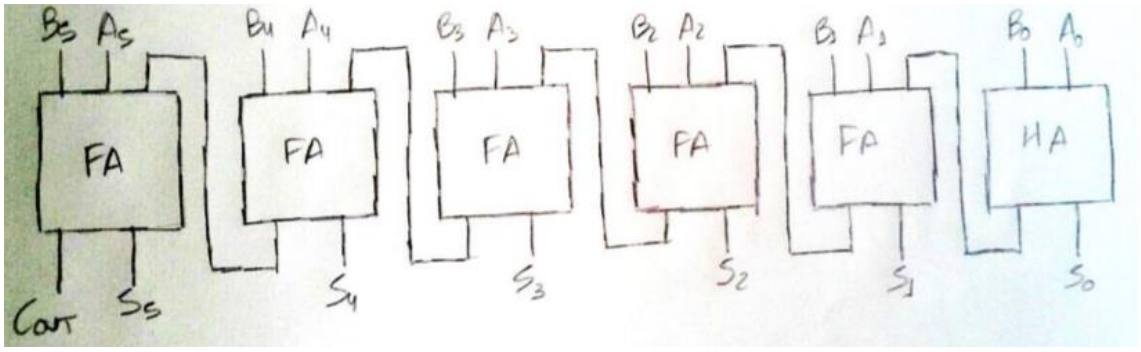
Nesse circuito, o complemento de 2 é realizado invertendo-se a entrada I de 4 bits e somando 1 à mesma através dos quatro somadores. A partir disso, um circuito seleciona se a saída final será a entrada I original (M = 0) ou o complemento de 2 de I (M = 1).



08.


A1
B1
TIN1
A0
B0
FULL
SUBTRACTOR
HALF
SUBTRACTOR
TOUT1
S1
TOUT0
S0

09.


B5
A5
B4
A4
B3
A3
B2
A2
B1
A1
B0
A0
FA
FA
FA
FA
FA
HA
COUT
S5
S4
S3
S2
S1
S0