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NOME: FELIPE ARCHANJO DA CUNHA MENDES
RA: 225240

1ª AVALIAÇÃO

(1)

PRECISÃO SIMPLES: 32 BITS
- SINAL → 1
- EXPOENTE → 8, EM EXCESSO DE 127 BITS
- MANTISSA → 23

$2,348 \cdot 10^4 = 23480 = 10110111011000_2$
$= \boxed{1}.0110111011000 \cdot 2^{14}$
MANTISSA

↳ O MSB NÃO OCUPA A POSIÇÃO DE UM BIT PORQUE ELE SEMPRE É UM

MANTISSA: 01101110111000
EXPOENTE: 14 + 127 = 141 = 10001101

O NUMERO COMPLETO REPRESENTADO EM PONTO FLUTUANTE:

0 10001101 01101110111000000000000

spiral

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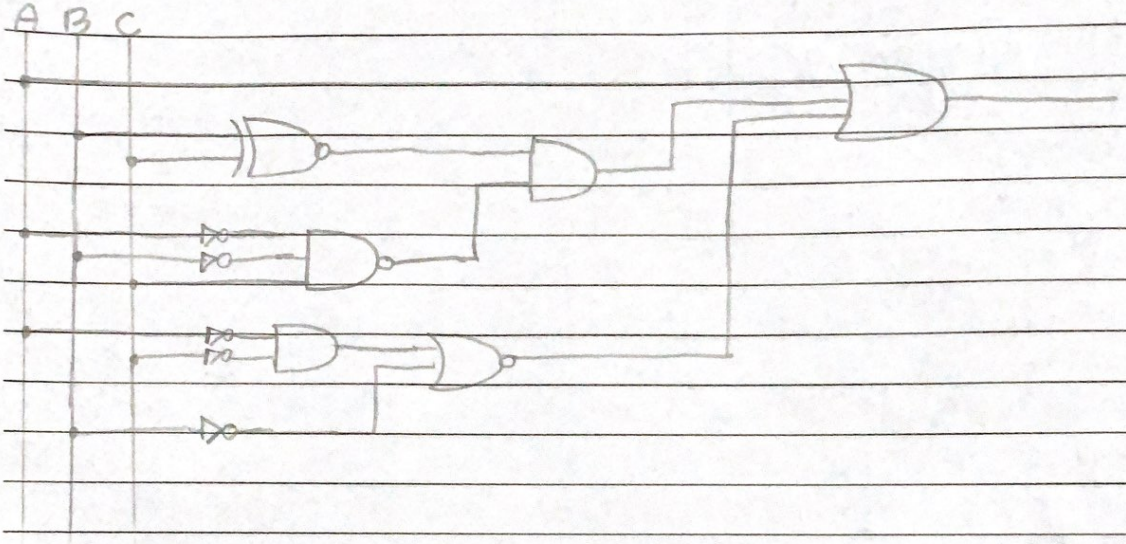
S T Q Q S S D

(2)

1º PASSO: DESENHAR O CIRCUITO BRUTO

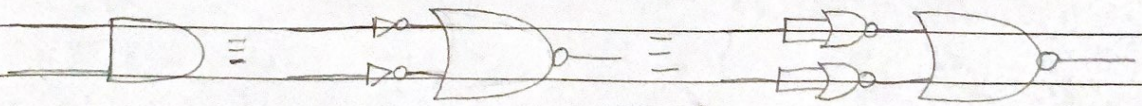


2º PASSO: TRANSFORMAR ALGUMAS PORTAS LÓGICAS EM NOR

#PORTA NOT:

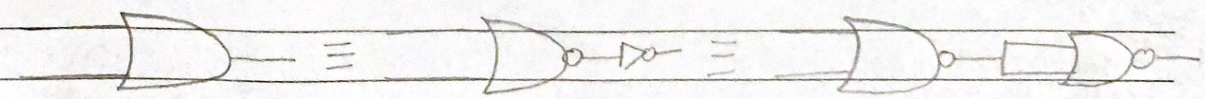
#PORTA AND:

* $A.B \equiv (\overline{\overline{A}.\overline{B}}) \equiv (\overline{\overline{A}+\overline{B}})$



#PORTA OR:

* $A+B \equiv (\overline{\overline{A}+\overline{B}})$



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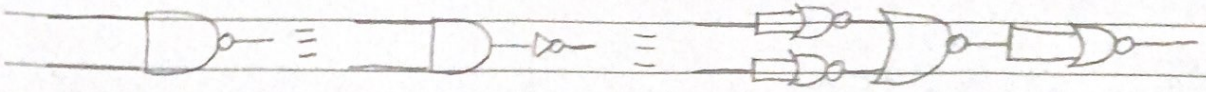
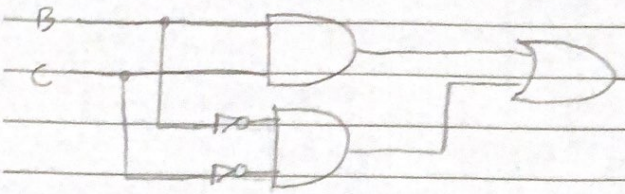
#PORTA NAND:



#PORTA XNOR:



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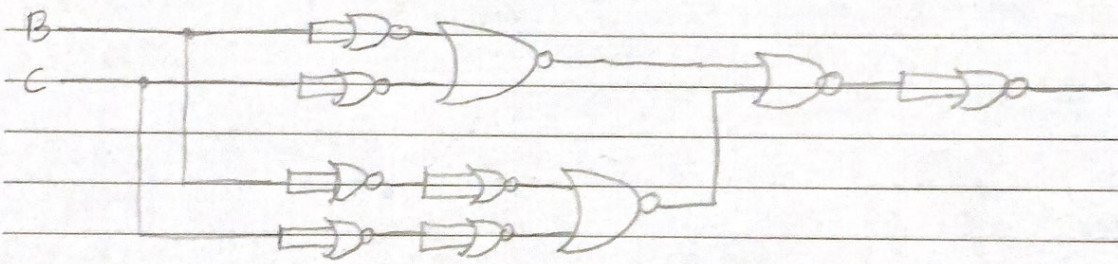

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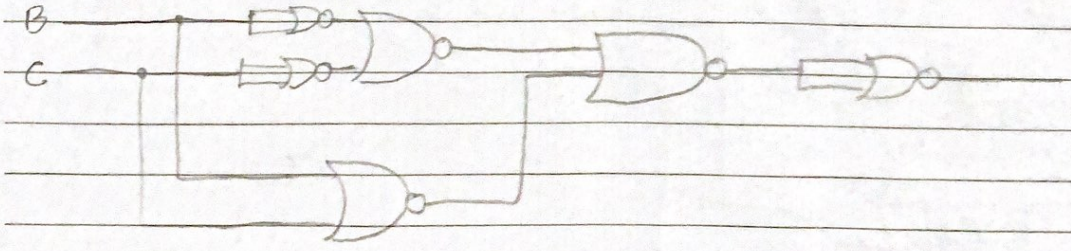

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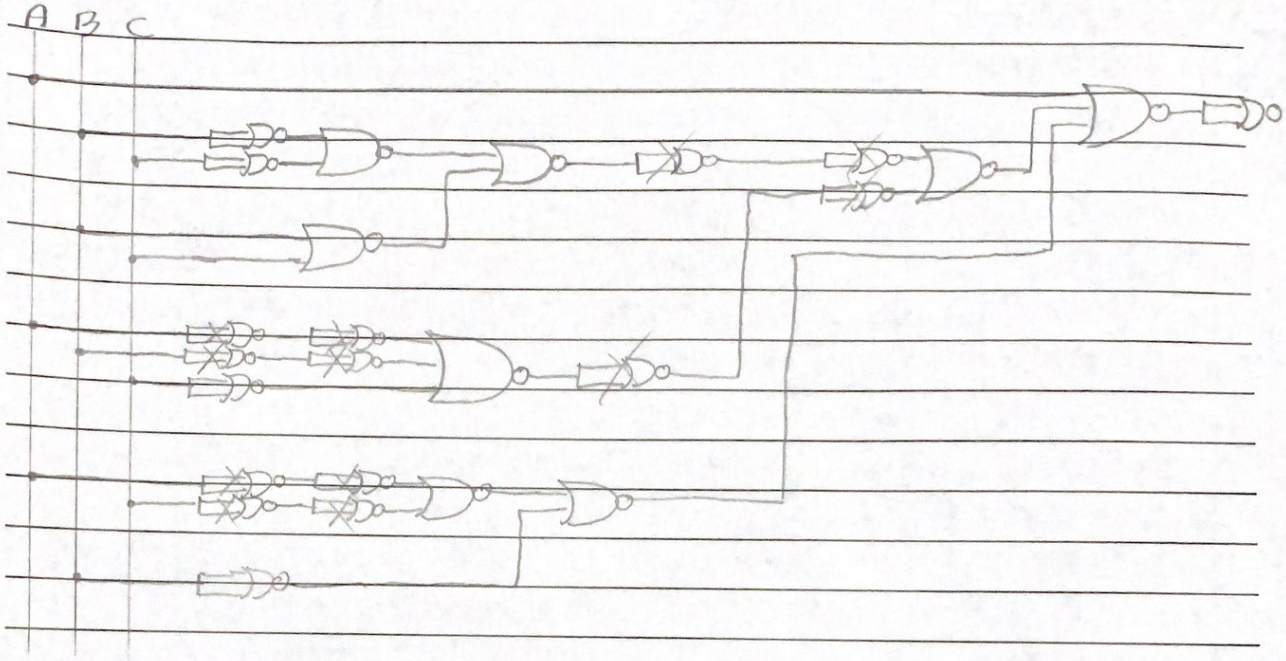
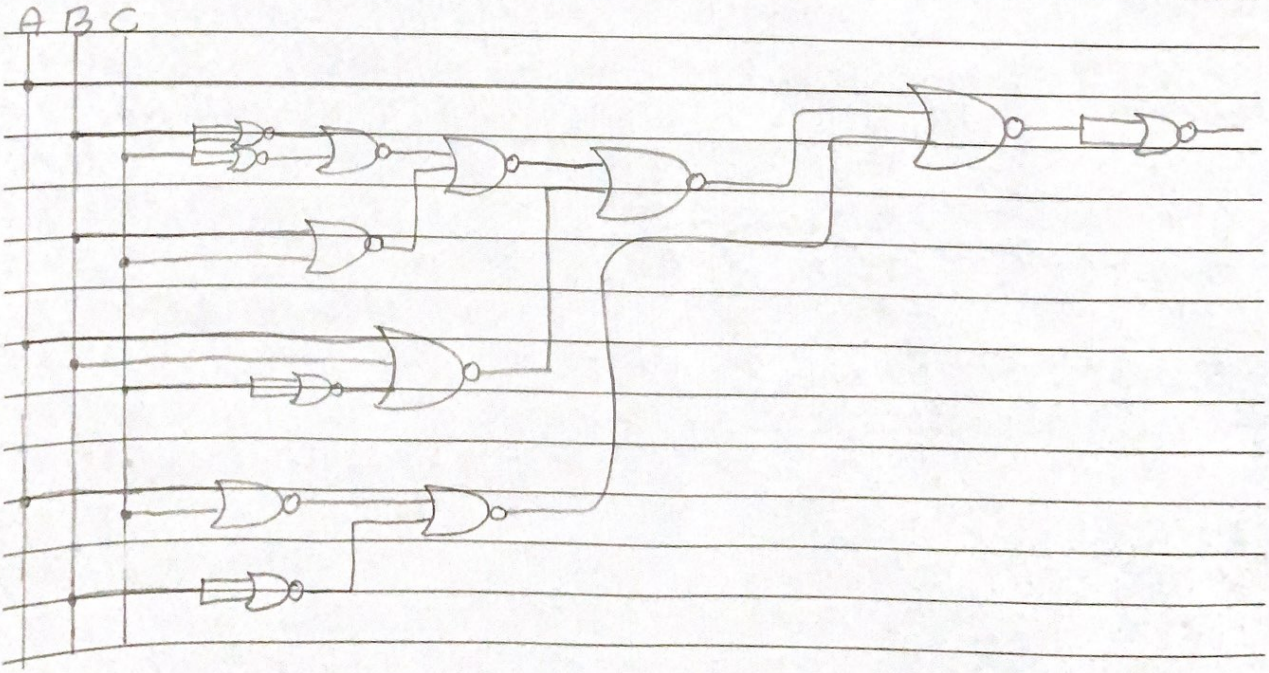
3º PASSO: REMONTAR O CIRCUITO COM AS PORTAS OBTIDAS APÓS A TRANSFORMAÇÃO:



4º PASSO: CIRCUITO FINAL, SIMPLIFICADO PELOS NOR



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③

ENTRADAS: 4

SAÍDAS: 1

CONDIÇÃO: SW1 e SW4 NÃO FECHAM AO MESMO TEMPO

LEGENDA:

- CHAVE ABERTA: 0
- CHAVE FECHADA: 1

#TABELA VERDADE

SW1	SW2	SW3	SW4	ALTO
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	X
1	0	1	0	1
1	0	1	1	X
1	1	0	0	1
1	1	0	1	X
1	1	1	0	1
1	1	1	1	X

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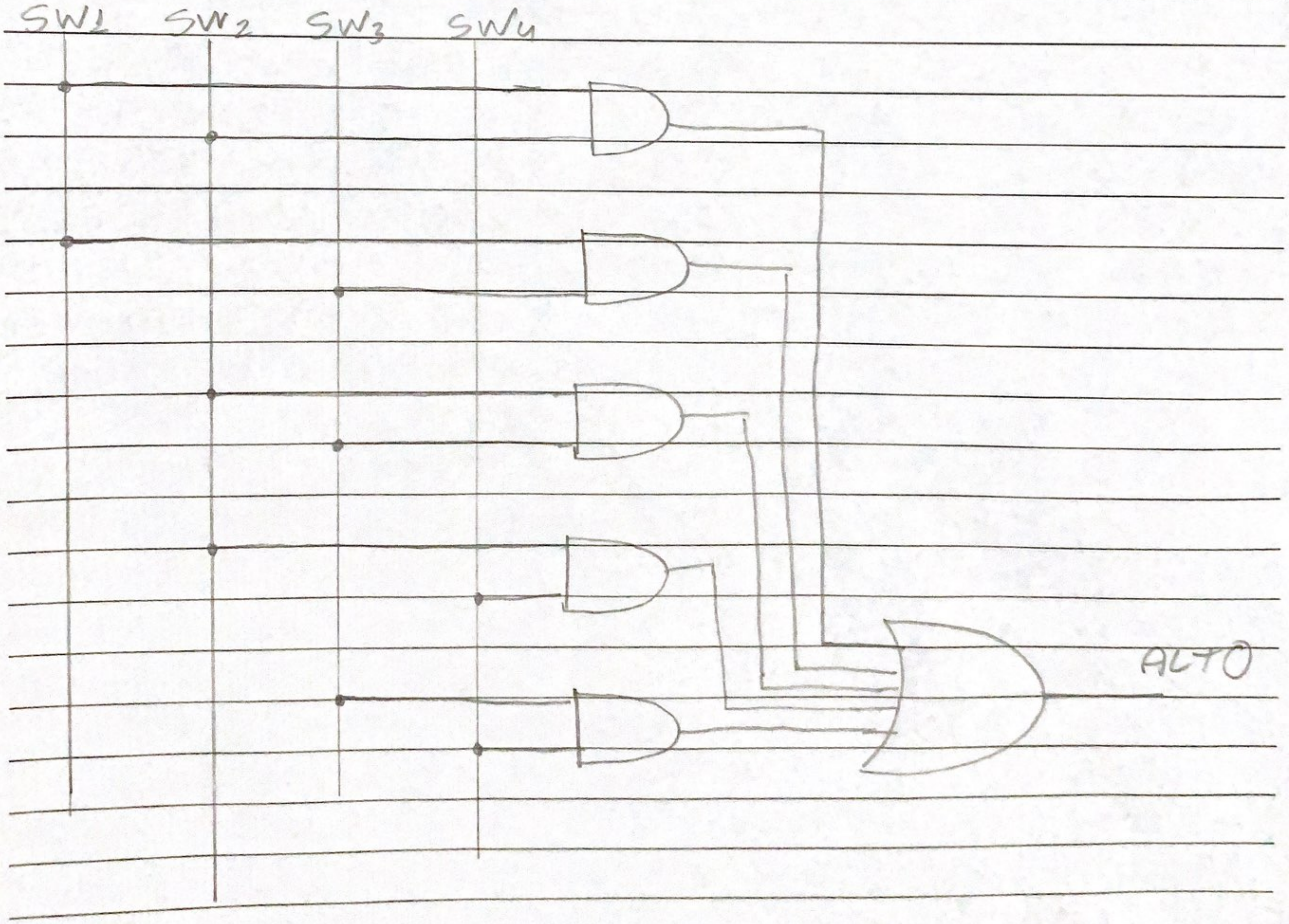
S T Q Q S S D

MAPA DE KARNAUGH

	$\overline{SW_3}\,\overline{SW_4}$	$\overline{SW_3}\,SW_4$	$SW_3\,SW_4$	$SW_3\,\overline{SW_4}$	
$\overline{SW_1}\,\overline{SW_2}$	0	0	1	0	$\overline{SW_2}$
$\overline{SW_1}\,SW_2$	0	1	1	1	SW_2
$SW_1\,SW_2$	1	X	X	1	
$SW_1\,\overline{SW_2}$	0	X	X	1	$\overline{SW_2}$
	$\overline{SW_4}$	SW_4	SW_4	$\overline{SW_4}$	

$$ALTO = SW_1 \cdot SW_2 + SW_1 \cdot SW_3 + SW_2 \cdot SW_3 + SW_2 \cdot SW_4 + SW_3 \cdot SW_4$$

DIAGRAMA DE PORTAS LOGICAS



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4

a)

$$\Big[\overline{(\bar{B}+C)+\overline{(\bar{A}\cdot B+(C\oplus D))}}+\overline{(\bar{B}\cdot\overline{(\bar{A}D)})}\Big]\cdot B\cdot\Big[\overline{(C\oplus D)}+\overline{(\bar{B}\cdot\overline{(\bar{A}D)})}\Big]$$

b)

$$\equiv \overline{(\bar{B}+C)}+\overline{(\bar{A}B+(C\oplus D))}+\overline{(\bar{B}(\bar{A}D))}\cdot\bar{B}\cdot\overline{(C\oplus D)}+\overline{(B\cdot(\bar{A}D))}$$

$$\equiv B\bar{C}\,\overline{(\bar{A}B+(C\oplus D))}+\overline{(\bar{B}(\bar{A}D))}+\bar{B}+\overline{(C\oplus D)}+\overline{(\bar{B}(\bar{A}D))}$$

$$\equiv B\bar{C}\cdot(\bar{A}B+(C\oplus D))+(B+AD)+\bar{B}+\overline{(C\oplus D)}+(B+AD)$$

$$\equiv B+AD+\bar{B}+\overline{(C\oplus D)}+B\bar{C}(\bar{A}B+(C\oplus D))$$

$$= B+AD+\bar{B}+\overline{(C\oplus D)}+\bar{A}B\bar{C}+B\bar{C}(C\oplus D)$$ ABSORÇÃO

$$\equiv B+AD+\bar{B}+\overline{(C\oplus D)}+B\bar{C}+\bar{A}B\bar{C}$$

$$\equiv B+AD+\bar{B}+C\odot D+B\bar{C}(1+\bar{A})$$

$$\equiv B+AD+\bar{B}+C\odot D+B\bar{C}$$

$$\equiv (B+\bar{B})+AD+C\odot D+B\bar{C}$$

$$\equiv 1 \rightarrow \text{TAUTOLOGIA}$$

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C) COMO A EXPRESSÃO SIMPLIFICADA É UMA TAUTOLOGIA, BASTA, PORTANTO, CRIAR ALGUM CIRCUITO TAUTOLÓGICO.

COM ISSO,