1)

Função correspondente ao circuito:

$$F = (a'bc) + (a'b) + (b'c) + (b'c')$$

Expressando a função como uma função de Minitermos:

$$F = (a'bc) + \underbrace{(a'b)}_{\text{falta c}} + \underbrace{(b'c)}_{\text{falta a}} + \underbrace{(b'c')}_{\text{falta a}}$$

$a'b.(c+c') = \cancel{a'bc} + a'bc'$

$b'c.(a+a') = ab'c + a'b'c$

$b'c'.(a+a') = ab'c' + a'b'c'$

$F = a'bc + a'bc' + ab'c + a'b'c + ab'c' + a'b'c'$

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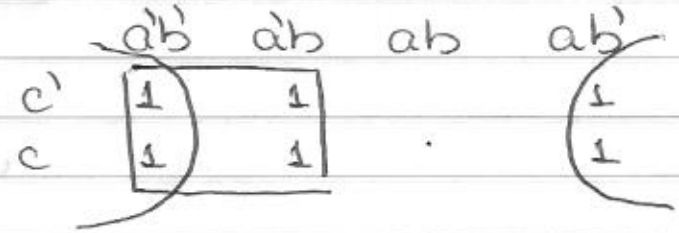
3 2 5 1 4 0

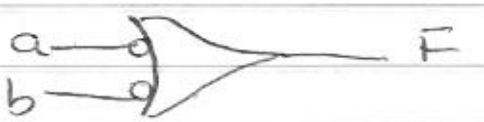
$F = \Sigma'(0,1,2,3,4,5)$

Simplificando a função:



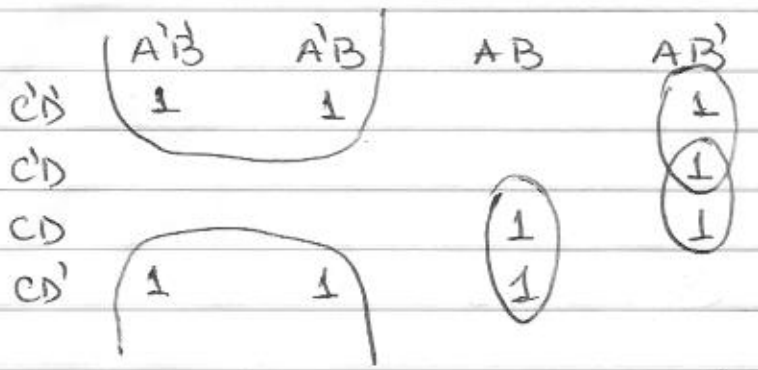
$F = a' + b'$

Circuito da função simplificada:



2) Função representada na Tabela:

$F(A,B,C,D) = A'B'C'D' + A'B'CD' + A'BC'D' + A'BCD' + AB'C'D' + AB'C'D + AB'CD + ABCD' + ABCD$



$F = A'D' + ABC + AB'C' + AB'D$ //

3)

$F(a,b,c) = (a'c) + (ab') + (b+c')'$ De Morgan

$(a'c) + (a.b') + (b'.c'')$ Dupla Negação

$\underbrace{(a'.c)}_{\text{falta b}} + \underbrace{(a.b')}_{\text{falta c}} + \underbrace{(b'.c)}_{\text{falta a}}$

$a'c(b+b') = a'bc + a'b'c$

$ab'(c+c') = ab'c + ab'c'$

$b'c(a+a') = ~~abc~~ + ~~a'b'c~~$

$F(a,b,c) = a'bc + a'b'c + ab'c + ab'c'$

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3 1 5 4

$F(a,b,c) = \Sigma'(1,3,4,5)$

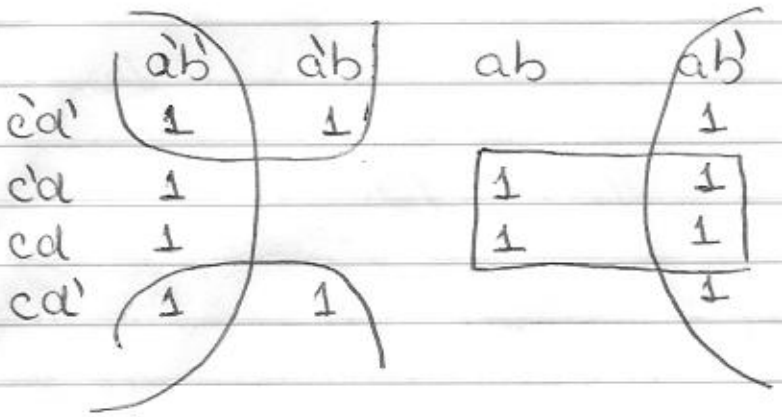
$F(a,b,c) = \pi(0,2,6,7)$

$F(a,b,c) = (a+b+c).(a+b'+c).(a'+b'+c).(a'+b'+c')$

4)

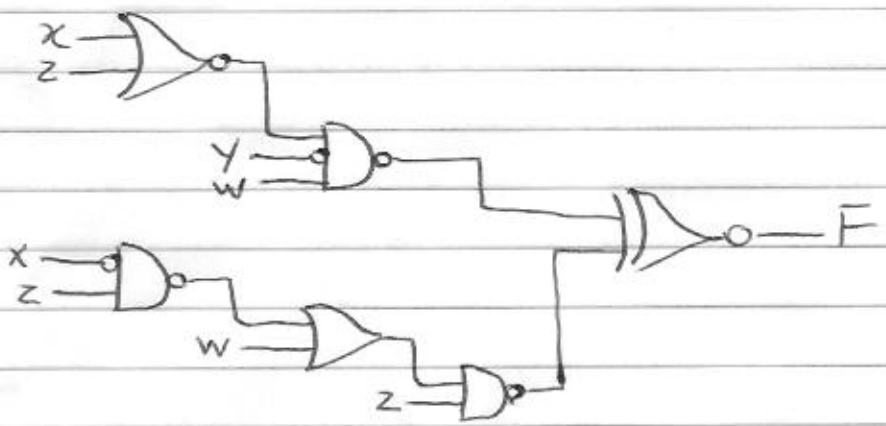
a) $F(a,b,c,d) = \Sigma'(0,1,2,3,4,6,8,9,10,11,13,15)$

$F(a,b,c,d) = a'b'c'd' + a'b'c'd + a'b'cd' + a'b'cd + a'bc'd' + a'bcd' + ab'c'd' + ab'c'd + ab'cd' + ab'cd + abc'd + abcd$



$F = a'd' + b' + ad$

5)



6)

a) P = psicóloga E = engenharia M = mulher

$(\exists x)((M(x) \wedge P(x)) \wedge E(x))$

b) A = astronautas T = bem treinados

$(\forall x)(A(x) \rightarrow T(x))$

c) F = felinos G = gatos P = ferozes

$(\forall x)((F(x) \wedge P(x)) \rightarrow G(x))$

d) D = dinossauro C = capturado M = morto

$(\forall x)(D(x) \rightarrow (C(x) \wedge M(x))$

7)

a) $\{4,5,6\} \vee \{1,5\} \Rightarrow \{4,5,6\} \cup \{1,5\} = \{1,4,5,6\}$

b) $\{2,4,6\} \rightarrow \{1,2\} \Rightarrow \{1,3,5\} \cup \{1,2\} \Rightarrow \{1,2,3,5\}$

c) $\{2\} \wedge \{1\} \Rightarrow \{2\} \cap \{1\} \Rightarrow \emptyset$

d) $\{2,3,5\} \leftrightarrow \{1,2,3\}$

$V_{p \rightarrow q} \Rightarrow \{2,3,5\} \rightarrow \{1,2,3\} \Rightarrow \{1,4,6\} \cup \{1,2,3\} = \{1,2,3,4,6\}$

$V_{q \rightarrow p} \Rightarrow \{1,2,3\} \rightarrow \{2,3,5\} \Rightarrow \{4,5,6\} \cup \{2,3,5\} = \{2,3,4,5,6\}$

$\{1,2,3,4,6\} \cap \{2,3,4,5,6\} = \{2,3,4,6\}$