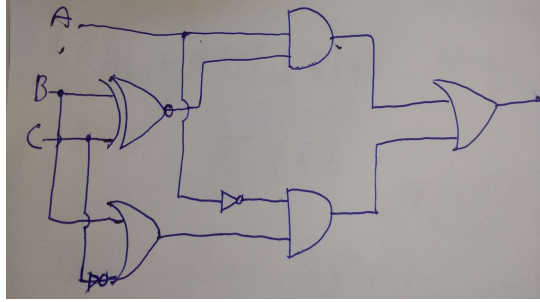


SEL0414 - Sistemas Digitais
Resolução Lista 4 - Circuitos Combinacionais

01

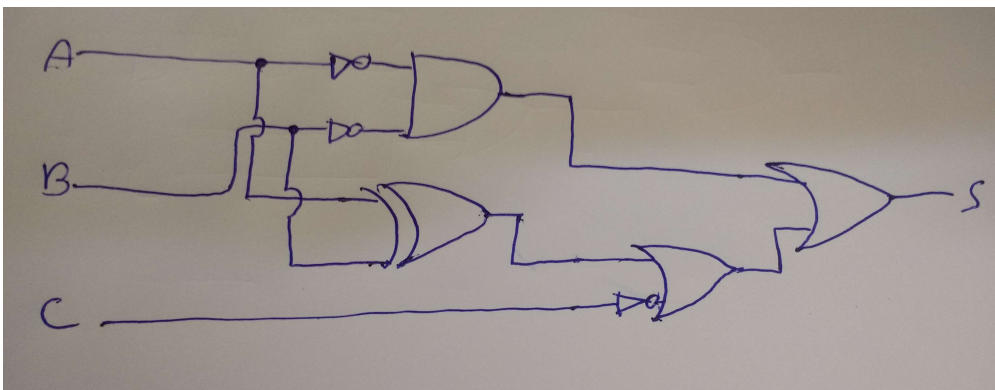
$$\begin{aligned} \bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}BC + A\bar{B}\bar{C} + ABC &= \bar{A}\bar{B}\bar{C} + B(\bar{A}\bar{C} + \bar{A}C) + A(\bar{B}\bar{C} + BC) \\ &= \bar{A}\bar{B}\bar{C} + B[A(\bar{C} + C)] + A(\bar{B}\bar{C} + BC) = \bar{A}\bar{B}\bar{C} + \bar{A}B + A(\bar{B}\bar{C} + BC) \\ &= \bar{A}(\bar{B}\bar{C} + B) + A(\bar{B}\bar{C} + BC) = \bar{A}(B + \bar{C}) + A(\bar{B}\bar{C} + BC) \end{aligned}$$



02

A	B	C	S
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

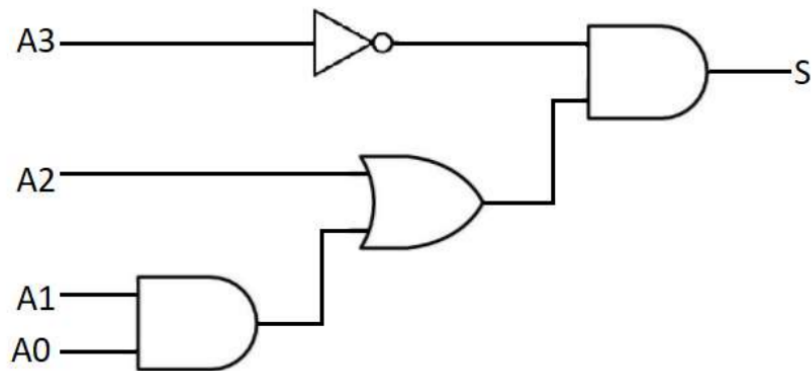
$$S = \bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}BC + A\bar{B}\bar{C} = \bar{A}\bar{B}(\bar{C} + C) + \bar{C}(\bar{A}B + A\bar{B}) = \bar{A}\bar{B} + \bar{C}(A \oplus B)$$



03

A_3	A_2	A_1	A_0	S
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

$$\begin{aligned}
 S &= \overline{A_3} \overline{A_2} A_1 A_0 + \overline{A_3} A_2 \overline{A_1} \overline{A_0} + \overline{A_3} A_2 \overline{A_1} A_0 + \overline{A_3} A_2 A_1 \overline{A_0} + \overline{A_3} A_2 A_1 A_0 \\
 &= \overline{A_3} \overline{A_2} A_1 A_0 + \overline{A_3} A_2 (\overline{A_1} \overline{A_0} + \overline{A_1} A_0 + A_1 \overline{A_0} + A_1 A_0) \\
 &= \overline{A_3} \overline{A_2} A_1 A_0 + \overline{A_3} A_2 (A_1 \oplus A_0 + (\overline{A_1} \oplus A_0)) = \overline{A_3} \overline{A_2} A_1 A_0 + \overline{A_3} A_2 \\
 &= \overline{A_3} (\overline{A_2} A_1 A_0 + A_2) = \overline{A_3} (A_2 + A_1 A_0)
 \end{aligned}$$



04

P	I	L	A
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

$$A = \bar{P}\bar{I}L + P\bar{I}L + P\bar{I}\bar{L} + P I L = \bar{I}L(\bar{P} + P) + P I(\bar{L} + L) = \bar{I}L + P I$$

