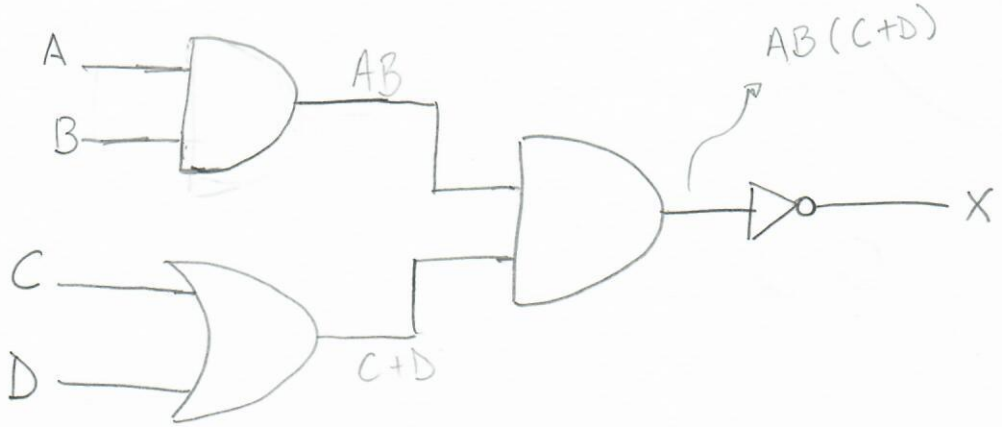
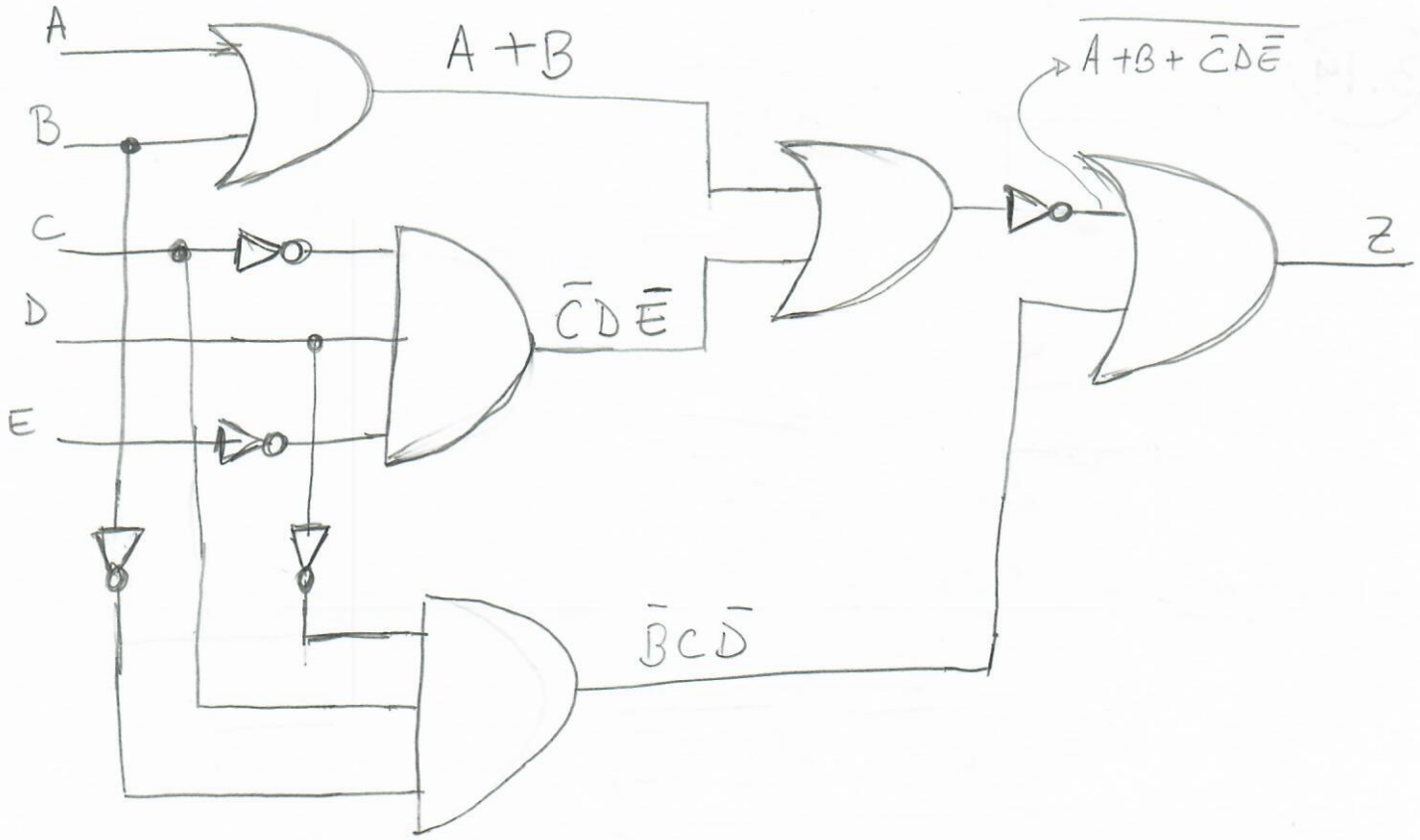
ET46B - Sistemas Digitais

Capítulo 3

3.16 a) $X = \overline{AB(C+D)}$



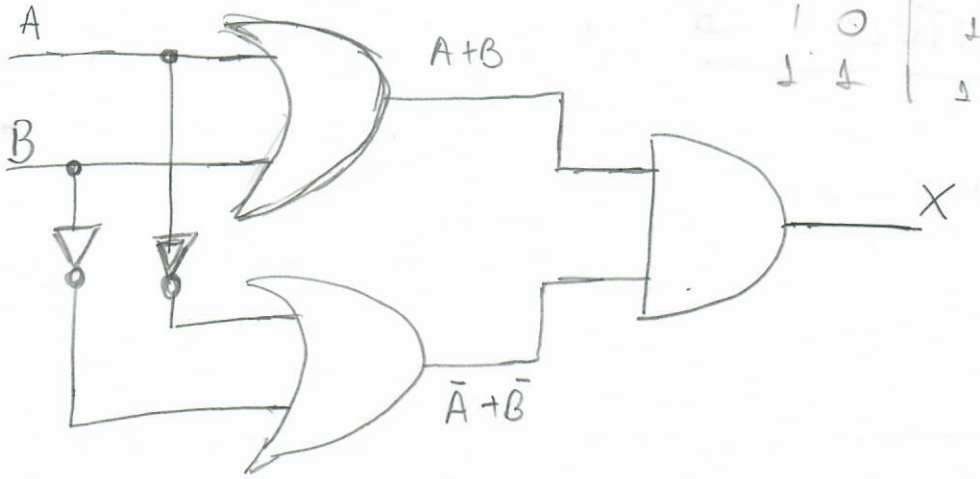
b) $Z = \overline{A+B+\bar{C}D\bar{E}} + \bar{B}C\bar{D}$



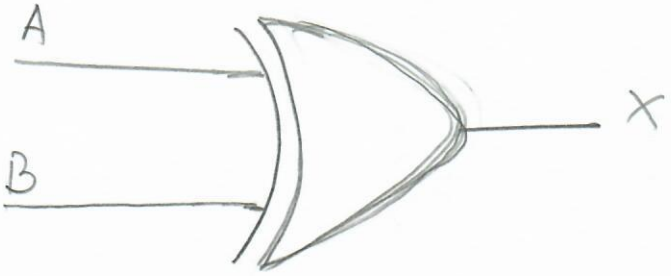
f) $X = (A+B)(\bar{A}+\bar{B})$

A	B	A+B	$\bar{A}+\bar{B}$	X
0	0	0	1	0
0	1	1	1	1
1	0	1	1	1
1	1	1	0	0

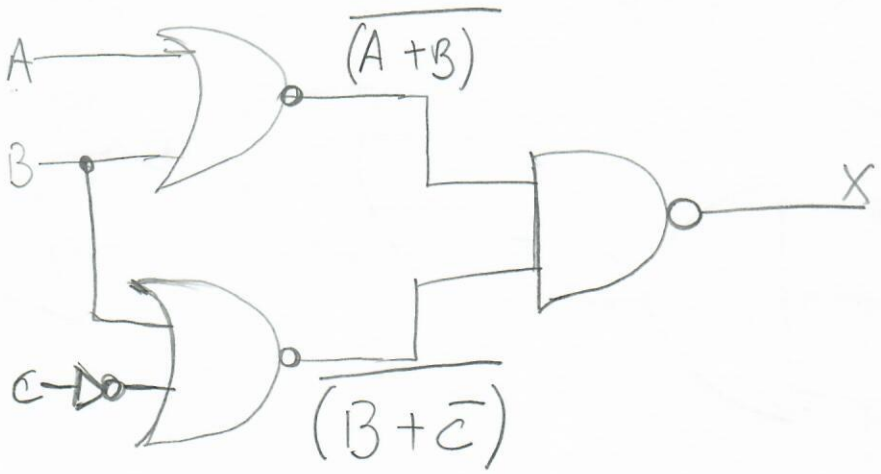
XOR



OU



3.19



i) EXPRESSÃO PARA A SAÍDA DO CIRCUITO:

$$X = \overline{\overline{(A+B)} \cdot \overline{(B+\bar{C})}}$$

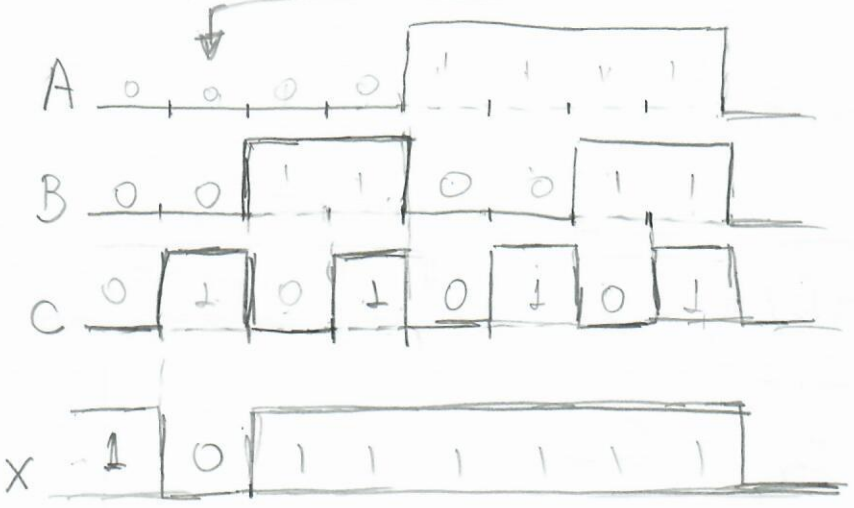
A QUAL PODE SER SIMPLIFICADA COMO

$$X = (A+B)+(B+\bar{C})$$

(i) TABELA-VERDADE:

A	B	C	A+B	$B+\bar{C}$	X
0	0	0	0	1	1
0	0	1	0	0	0
0	1	0	1	1	1
0	1	1	1	1	1
1	0	0	1	1	1
1	0	1	1	0	1
1	1	0	1	1	1
1	1	1	1	1	1

(ii) DIAGRAMA DE SINAIS:



(3.22) PROVE:

i) $x + \bar{x}y = x + y$

x	y	$\bar{x}y$	$x + \bar{x}y$	$x + y$
0	0	0	0	0
0	1	1	1	1
1	0	0	1	1
1	1	0	1	1

ii) $\bar{x} + xy = \bar{x} + y$

x	y	$\bar{x}$	xy	$\bar{x} + xy$	$\bar{x} + y$
0	0	1	0	1	1
0	1	1	0	1	1
1	0	0	0	0	0
1	1	0	1	1	1

(3.24) a) $X = (M+N)(\bar{M}+P)(\bar{N}+\bar{P})$ SIMPLIFIQUE

$= (M\bar{M} + MP + N\bar{M} + NP)(\bar{N} + \bar{P})$

$= MP\bar{N} + MP\bar{P} + N\bar{M}\bar{N} + N\bar{M}\bar{P} + NP\bar{N} + NP\bar{P}$

$= MP\bar{N} + N\bar{M}\bar{P}$

(3.26) c) $\overline{AB\bar{C}\bar{D}} = \overline{(AB)} + \overline{\bar{C}\bar{D}}$ SIMPLIFIQUE

$= \overline{(AB)} + CD$

$= \bar{A} + \bar{B} + CD$

g) $\overline{A\overline{(B+\bar{C})}D} = \bar{A} + \overline{\overline{(B+\bar{C})}} + \bar{D}$

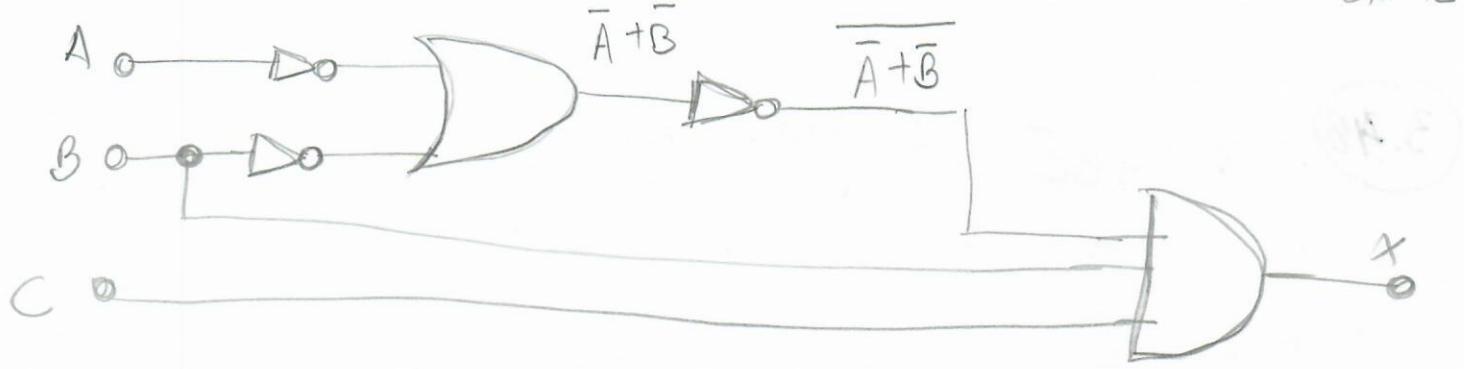
$= \bar{A} + B + \bar{C} + \bar{D}$

h) $\overline{(M+\bar{N})(\bar{M}+N)} = \overline{(M+\bar{N})} + \overline{(\bar{M}+N)}$

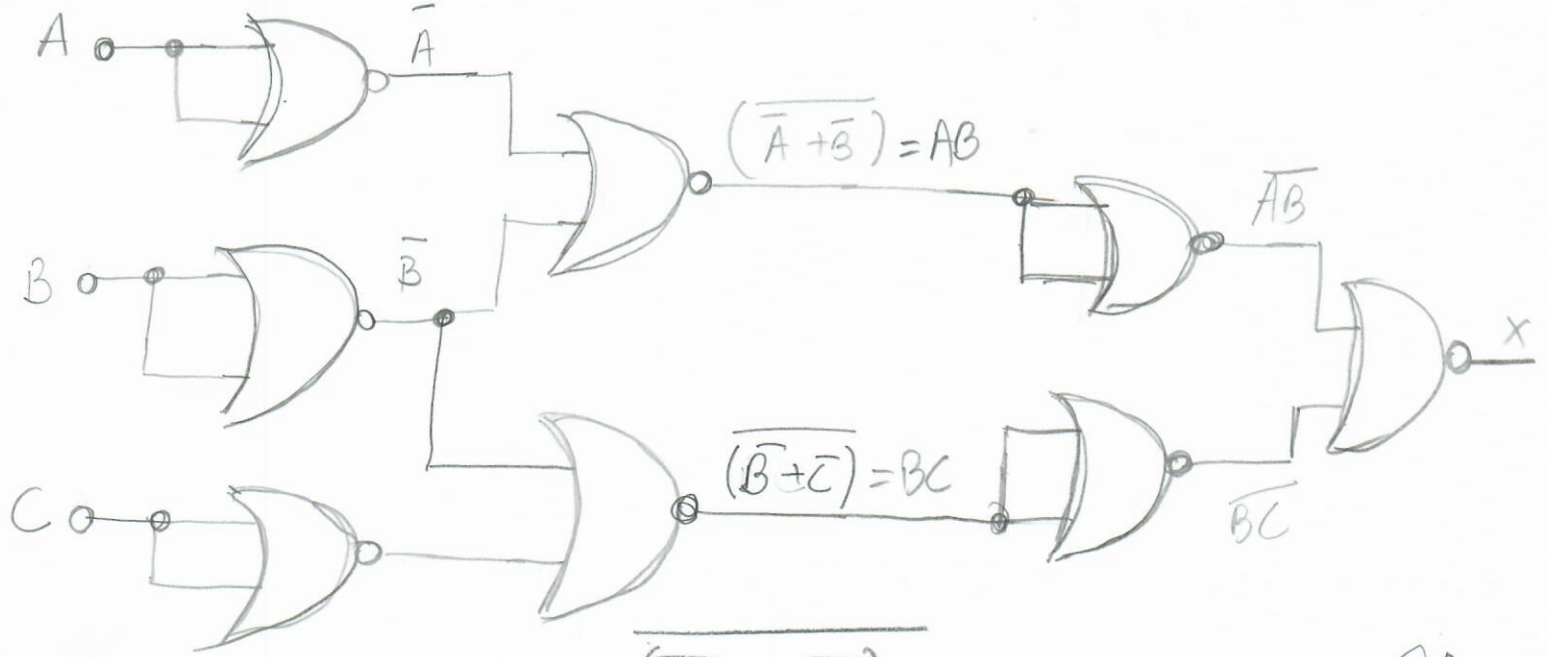
$= \bar{M} \cdot \cancel{\bar{\bar{N}}} + \cancel{\bar{\bar{M}}} \cdot \bar{N}$

$= \bar{M} \cdot N + M \cdot \bar{N}$

3.29 – CONVERTA P/ USAR APENAS PORTAS NOR.
- OBTENHA A EXPRESSÃO O CKT RESULTANTE
- SIMPLIFIQUE E COMPARE COM O CKT ORIGINAL



⇒ CKT ORIGINAL: $X = \overline{(\bar{A}+\bar{B})}\,BC$



⇒ CKT com NOR: $X = \overline{(\overline{AB} + \overline{BC})}$

→ CKT ORIGINAL:

$$X = \overline{(\bar{A}+\bar{B})}\,BC$$

$$= \overline{(A \cdot B)} \cdot BC$$

$$= A\,B\,\bar{B}\,C$$

$$= ABC$$

→ CKT NOR:

$$X = \overline{\bar{A}B + \bar{B}C}$$

$$= \overline{(AB \cdot BC)}$$

$$= A\,B\,\bar{B}\,C$$

$$= ABC$$

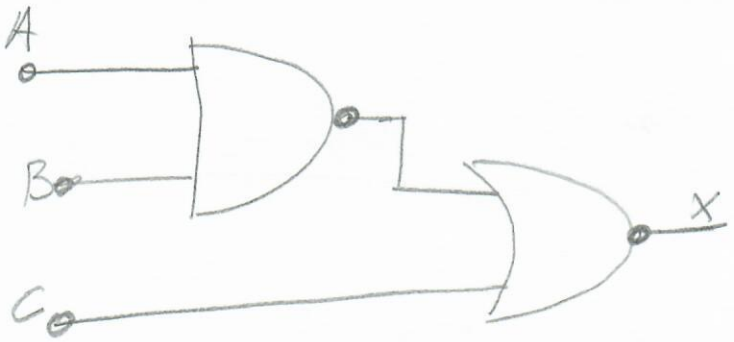
3.48) $X = AB\bar{C}$ { 1 PORTA NOR; 1 PORTA NAND

$$X = A \cdot B \cdot \bar{C}$$

$$= \overline{(\bar{A}+\bar{B})} \cdot \bar{C}$$

$$= \overline{(\bar{A}+\bar{B})+C}$$

$$= \overline{\overline{(AB)}+C}$$



3.49 $y = ABCD$ { APENAS COM PORTAS NAND