Lista 2 de Matemática

1- $F = \overline{ABC\bar{D}E} + \bar{A}B\bar{C}\bar{D}E + ABCDE + A\bar{B}\bar{C}\bar{D}E + AB\bar{C}DE$

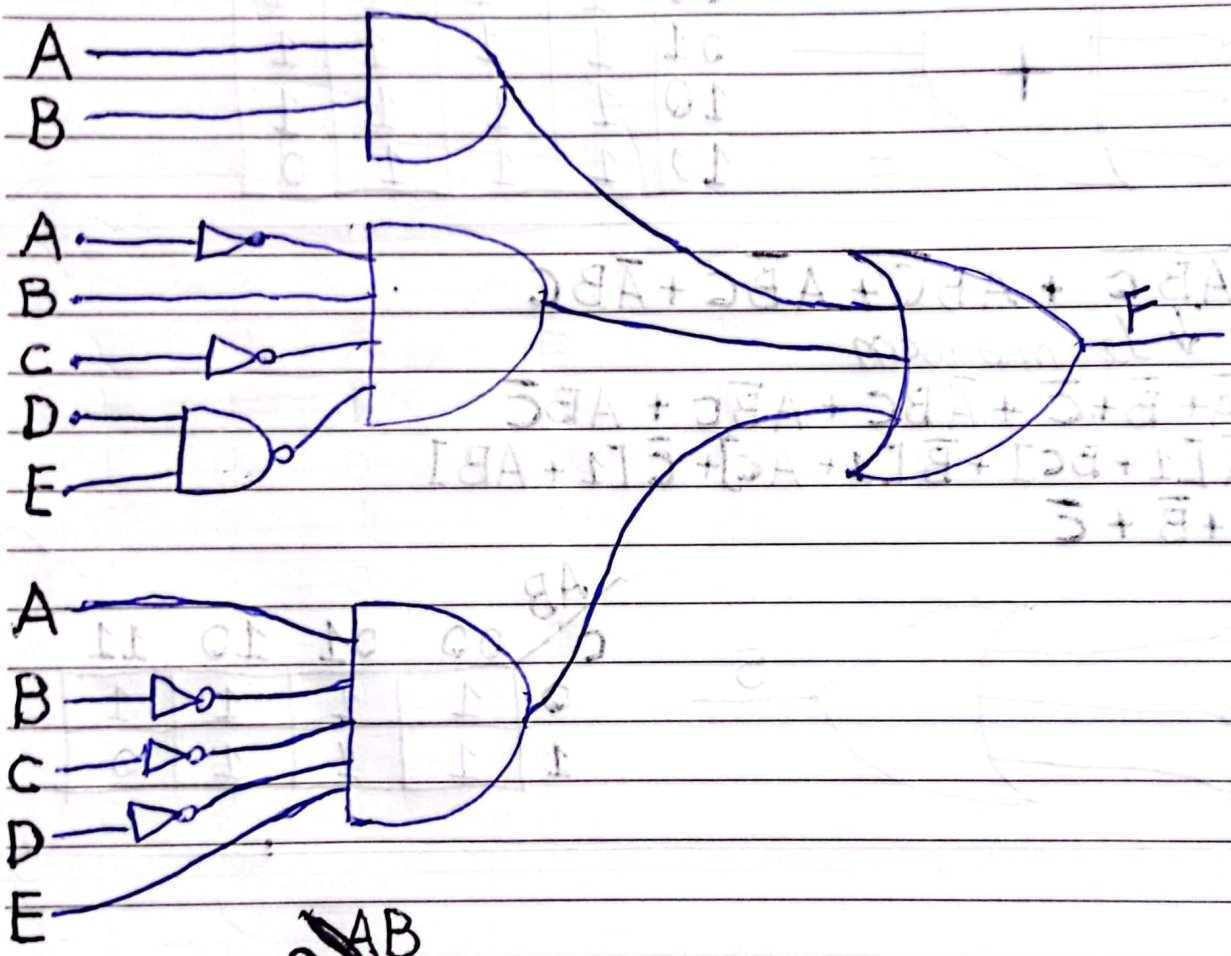
$= AB\bar{C} + AB\bar{D} + AB\bar{E} + \bar{A}B\bar{C}\bar{D} + AB\bar{C}\bar{E} + A\bar{B}\bar{C}\bar{D}E + ABDE$ (c.r.c.)

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

$= AB + \bar{C}[\bar{A}B\bar{D} + \bar{A}B\bar{E} + A\bar{B}DE]$

$= AB + \bar{C}[\bar{A}B\overline{DE} + A\bar{B}\bar{D}E]$

$= AB + \bar{A}B\bar{C}\overline{DE} + A\bar{B}\bar{C}\bar{D}E$



CDE \ AB	00	01	10	11
000	0	1	0	1
001	0	1	1	1
010	0	1	0	1
011	0	0	0	1
100	0	0	0	1
101	0	0	0	1
110	0	0	0	1
111	0	0	0	1

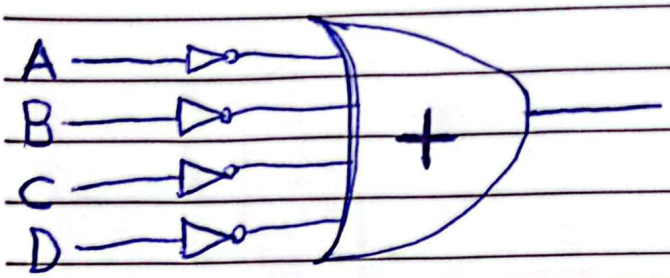
2- $\bar{A}\bar{B}C\bar{D} + \bar{A}B\bar{C}D + \bar{A}BCD + \overline{\bar{A}BC}D + \overline{\bar{A}BC}D$ ↳ de morgan

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

$= \bar{B}\,[1 + AC\bar{D}] + (\bar{A}+\bar{B})CD + \bar{A} + \bar{C} + \bar{D}$

$= \bar{B}\,[(\bar{A} + CD) + 1] + \bar{A} + \bar{C} + \bar{D}$

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



CD \ AB	00	01	10	11
00	1	1	1	1
01	1	1	1	1
10	1	1	1	1
11	1	1	1	0

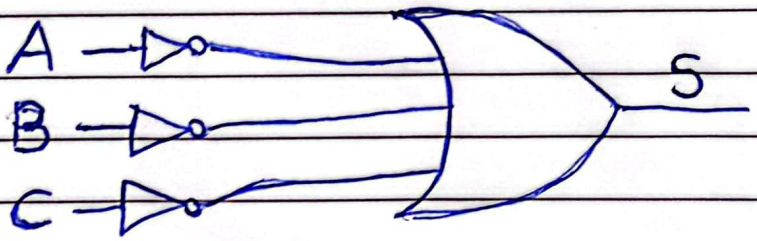
3- $S = \overline{\bar{A}\bar{B}C} + AB\bar{C} + A\bar{B}C + \bar{A}BC$

↓ de morgan

$= \bar{\bar{A}} + \bar{\bar{B}} + \bar{\bar{C}} + \bar{A}BC + A\bar{B}C + AB\bar{C}$

$= A\,[1 + BC] + B\,[1 + AC] + C\,[1 + AB]$

$= A + B + C$



C \ AB	00	01	10	11
0	1	1	1	1
1	1	1	1	0

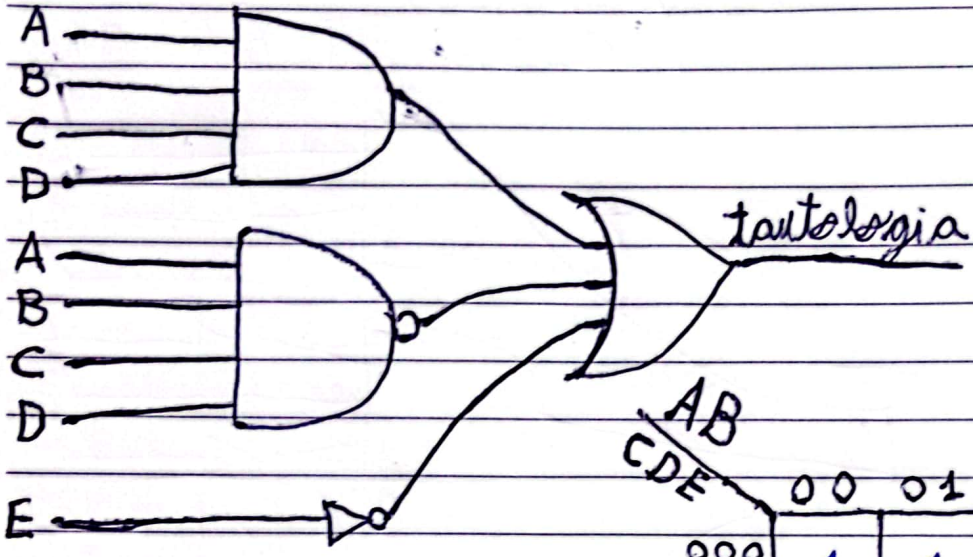
4- $ABCD + \overline{AB} + \overline{CD} + CD\overline{E} + \overline{CDE}$

$= ABCD + \overline{AB} + \overline{CD} + CD\overline{E} + \overline{CD} + \overline{E}$

$= ABCD + \overline{AB} + \overline{CD} + \overline{E}[1 + CD]$

$= ABCD + \overline{ABCD} + \overline{E}$

= Tautologia



CDE \ AB	00	01	10	11
000	1	1	1	1
001	1	1	1	1
010	1	1	1	1
011	1	1	1	1
100	1	1	1	1
101	1	1	1	1
110	1	1	1	1
111	1	1	1	1

5- Questão 1 + Questão 4

A questão 4 é uma tautologia, na Regra do "+" se tivermos uma tautologia + alguma expressão o resultado é a própria tautologia.

Ex: $T + A = T$ T = tautologia