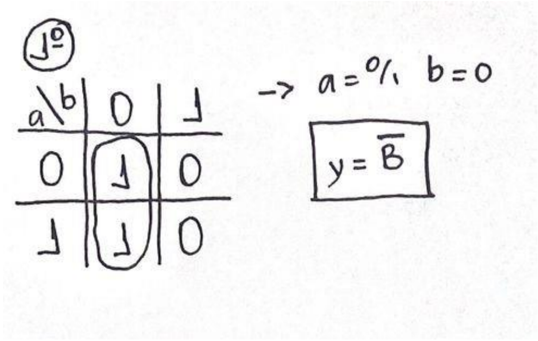
Atividade 2 - Sistemas Digitais

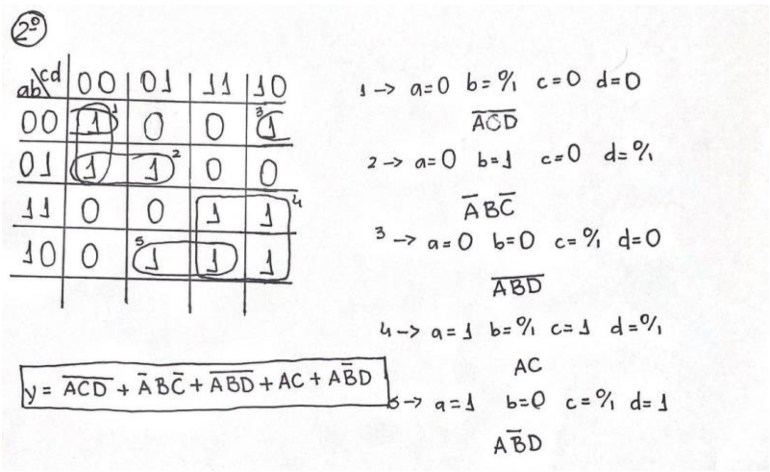
1 - Utilizando mapa de Karnaugh encontre a função booleana minimizada para a seguinte tabela verdade.

a	b	y
0	0	1
0	1	0
1	0	1
1	1	0



2 - Utilizando mapa de Karnaugh encontre a função booleana minimizada para a seguinte tabela verdade.

a b c d	y
0 0 0 0	1
0 0 0 1	0
0 0 1 0	1
0 0 1 1	0
0 1 0 0	1
0 1 0 1	1
0 1 1 0	0
0 1 1 1	0
1 0 0 0	0
1 0 0 1	1
1 0 1 0	1
1 0 1 1	1
1 1 0 0	0
1 1 0 1	0
1 1 1 0	1
1 1 1 1	1



3 - Utilizando mapa de Karnaugh encontre a função booleana minimizada para as seguintes tabelas da verdade.

a)

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

b)

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

c)

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

3º

a)

ab \ c	0	1
00	0	1
01	0	1
11	1	0
10	1	1

1 -> a=0 b=0/1 c=1

$\bar{A}C$

2 -> a=1 b=0/1 c=0

$A\bar{C}$

3 -> a=1 b=0 c=0/1

$A\bar{B}$

$\boxed{y = \bar{A}C + A\bar{C} + A\bar{B}}$

b)

ab \ c	0	1
00	1	0
01	1	0
11	1	0
10	1	1

1 -> a=0/1 b=0/1 c=0

$\bar{C}$

2 -> a=1 b=0 c=0/1

$A\bar{B}$

$\boxed{y = A\bar{B} + \bar{C}}$

c)

ab \ c	0	1
00	1	1
01	1	0
11	1	1
10	0	1

1 -> a=0 b=0 c=0/1

$\overline{AB}$

2 -> a=0 b=0/1 c=0

$\overline{AC}$

3 -> a=1 b=1 c=0/1

AB

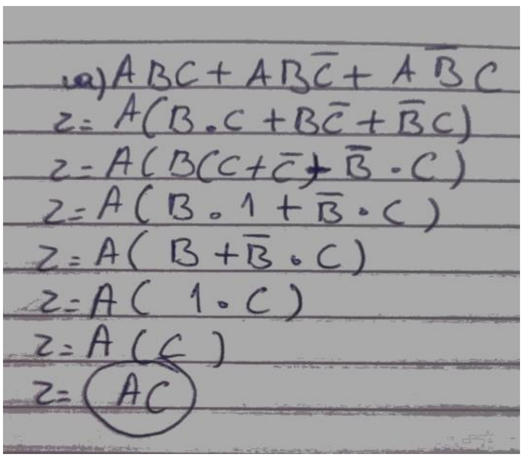
4 -> a=1 b=0/1 c=1

AC

$\boxed{y = \overline{AB} + \overline{AC} + AB + AC}$

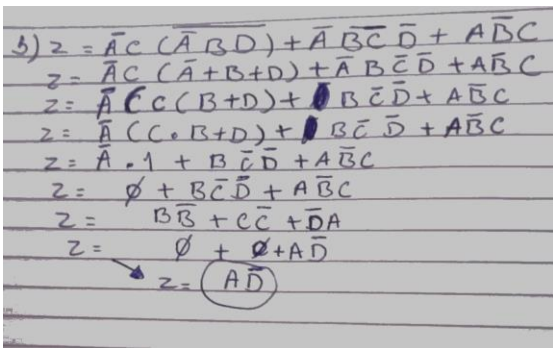
4 – Utilizando os conceitos de regras, leis, postulados e teoremas, simplifique as expressões a seguir.

a) $z = ABC + AB\overline{C} + A\overline{B}C.$



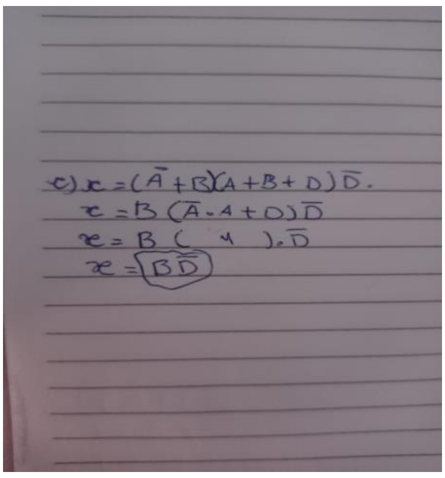
$$\text{a)}\ ABC + AB\overline{C} + A\overline{B}C$$
$$z = A(B.C + B\overline{C} + \overline{B}C)$$
$$z = A(B(C+\overline{C}) + \overline{B}.C)$$
$$z = A(B.1 + \overline{B}.C)$$
$$z = A(B + \overline{B}.C)$$
$$z = A(1.C)$$
$$z = A(C)$$
$$z = AC$$

b) $z = \overline{A}C(\overline{\overline{A}BD}) + \overline{A}B\overline{C}\,\overline{D} + A\overline{B}C.$



$$\text{b)}\ z = \overline{A}C(\overline{\overline{A}BD}) + \overline{A}\,\overline{BC}\,\overline{D} + A\overline{B}C$$
$$z = \overline{A}C(\overline{A}+B+D) + \overline{A}B\overline{C}\,\overline{D} + A\overline{B}C$$
$$z = \overline{A}CC(B+D) + B\overline{C}\,\overline{D} + A\overline{B}C$$
$$z = \overline{A}(C.B+D) + B\overline{C}\,\overline{D} + A\overline{B}C$$
$$z = \overline{A}.1 + B\overline{C}\,\overline{D} + A\overline{B}C$$
$$z = \varnothing + B\overline{C}\,\overline{D} + A\overline{B}C$$
$$z = B\overline{B} + C\overline{C} + \overline{D}A$$
$$z = \varnothing + \varnothing + A\overline{D}$$
$$z = A\overline{D}$$

c) $x = (\overline{A} + B)(A + B + D)\overline{D}.$



$$\text{c)}\ x = (\overline{A}+B)(A+B+D)\overline{D}.$$
$$x = B(\overline{A}.A + D)\overline{D}$$
$$x = B(\ 4\ ).\overline{D}$$
$$x = B\overline{D}$$