



- 1) Determine as expressões simplificadas  $S_1$ ,  $S_2$  e  $S_3$  a partir da tabela verdade mostrada abaixo:

A	B	C	$S_1$	$S_2$	$S_3$
0	0	0	1	1	0
0	0	1	0	1	1
0	1	0	1	1	0
0	1	1	1	0	0
1	0	0	1	1	1
1	0	1	1	1	1
1	1	0	0	1	1
1	1	1	1	0	0

$S_1$		$\bar{B}$		B
$\bar{A}$	1	0	1	1
A	1	1	1	0
	$\bar{C}$		C	$\bar{C}$

$$S_1 = \bar{A} \cdot \bar{C} + B \cdot C + A \cdot \bar{B}$$

$S_2$		$\bar{B}$		B
$\bar{A}$	1	1	0	1
A	1	1	0	1
	$\bar{C}$		C	$\bar{C}$

$$S_2 = \bar{B} + \bar{C}$$

$S_3$		$\bar{B}$		B
$\bar{A}$	0	1	0	0
A	1	1	0	1
	$\bar{C}$		C	$\bar{C}$

$$S_3 = \bar{B} \cdot C + A \cdot \bar{C}$$

- 2) Determine as expressões simplificadas  $S_1$ ,  $S_2$  e  $S_3$  a partir da tabela verdade mostrada abaixo. Considere o 'X' como "d'ont care", podendo assumir o valor '0' ou '1' conforme for mais adequado:

A	B	C	D	$S_1$	$S_2$	$S_3$
0	0	0	0	1	X	0
0	0	0	1	1	X	0
0	0	1	0	1	1	0
0	0	1	1	0	0	1
0	1	0	0	1	X	X
0	1	0	1	0	1	X
0	1	1	0	1	0	1
0	1	1	1	1	1	0
1	0	0	0	1	1	X
1	0	0	1	1	0	1
1	0	1	0	1	X	0
1	0	1	1	1	1	0
1	1	0	0	0	0	1
1	1	0	1	1	1	0
1	1	1	0	1	1	X
1	1	1	1	0	X	1

$S_1$		$\bar{C}$		C
$\bar{A}$	1	1	0	1
A	1	0	1	1
	$\bar{D}$		D	$\bar{D}$

$$S_1 = \bar{A} \cdot \bar{D} + \bar{B} \cdot \bar{C} + \bar{B} \cdot D + C \cdot \bar{D} + A \cdot B \cdot C + A \cdot \bar{B} + A \cdot \bar{C} \cdot D$$

S2		$\bar{C}$   C		
$\bar{A}$		1	0	1
		1	1	0
A		0	1	1
		1	0	1
		$\bar{D}$   D   $\bar{D}$		

$S2 = \bar{B} \cdot \bar{D} + B \cdot D + A \cdot C$

S3		$\bar{C}$   C		
$\bar{A}$		0	0	1
		1	0	1
A		1	0	1
		1	1	0
		$\bar{D}$   D   $\bar{D}$		

$S3 = \bar{A} \cdot \bar{B} \cdot C \cdot D + B \cdot \bar{D} + A \cdot \bar{B} \cdot \bar{C} + A \cdot B \cdot C$

3) Simplifique as expressões usando mapa de Karnaugh

a)  $S = \bar{A} \cdot B \cdot C \cdot \bar{D} + \bar{A} \cdot \bar{B} \cdot C \cdot D + \bar{A} \cdot \bar{B} \cdot \bar{C} \cdot \bar{D} + A \cdot B \cdot \bar{C} \cdot D + A \cdot \bar{B} \cdot \bar{C} \cdot D + A \cdot B \cdot C \cdot D + A \cdot \bar{B} \cdot \bar{C} \cdot \bar{D}$

S		$\bar{C}$   C		
$\bar{A}$		1	0	1
		0	0	0
A		0	1	1
		1	1	0
		$\bar{D}$   D   $\bar{D}$		

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

b)  $S = \bar{B} \cdot \bar{D} + \bar{A} + A \cdot \bar{B} \cdot \bar{C} \cdot D + A \cdot \bar{B} \cdot C \cdot D + \bar{A} \cdot \bar{C}$

S		$\bar{C}$   C		
$\bar{A}$		1	1	1
		1	1	1
A		0	1	0
		1	1	0
		$\bar{D}$   D   $\bar{D}$		

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

c)  $S(A, B, C) = \text{SOMA}(m1, m3, m4, m5, m7)$

S		$\bar{B}$   B		
$\bar{A}$		0	1	1
		1	1	1
		$\bar{C}$   C   $\bar{C}$		

$S = C + A \cdot \bar{B}$