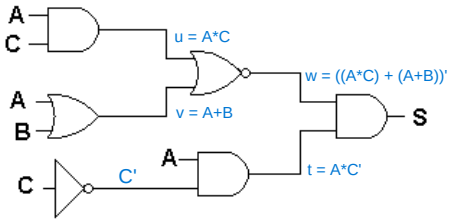
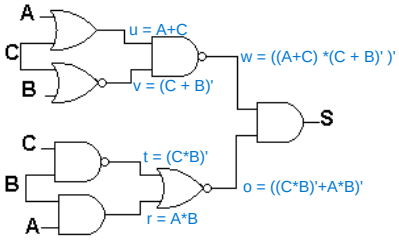
Univali – Circuitos Digitais – Lista de exercícios 01 – lógica combinacional

1) Escrever a expressão booleana correspondente aos diagramas abaixo:

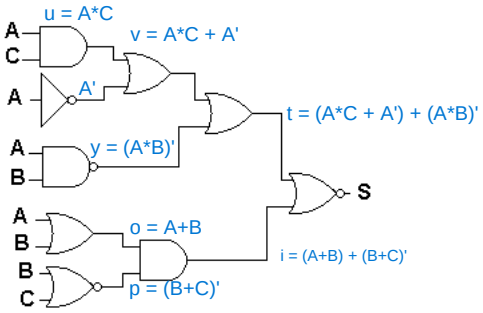
a. s =(AC + A+B)'AC'



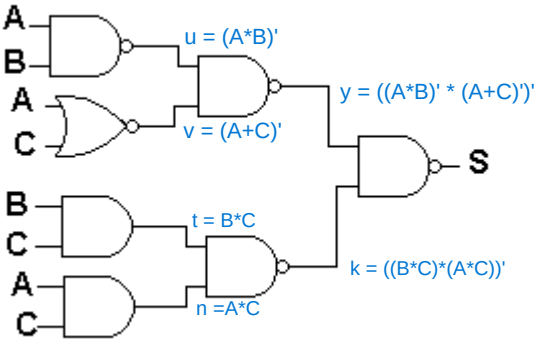
b. s = ((A+C)(C + B)')' ((CB)'+AB)'



c. s = ((AC + A') + (AB)' + A+B + (B+C)')'



d. s = (((AB)'(A+C)')'((BC)(AC))')'



2) Desenhar o diagrama representando cada uma das expressões abaixo;

a. $\overline{A.C} + \overline{B} + (\overline{B.C}) + (\overline{AB}) + (\overline{BCD})$

b. $[\overline{\overline{B}.(\overline{C+D}) + \overline{A} + (\overline{B.C})}].B + \overline{A.B}.C$

c. $\overline{\overline{A}.\overline{B}.C} + \overline{A+B+D}$

d. $\overline{\overline{A.C.\overline{B}} + C + D + \overline{B + A}}$

3) Representar a tabela verdade das expressões abaixo:

a. $\overline{A + C} + B(\overline{A + C}) + \overline{AB}$

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

b. $B.\overline{[(\overline{BC})+(\overline{A+B})]}$

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

c. $\overline{(\overline{A+\overline{B}+C}).(\overline{A.B.C})}$

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

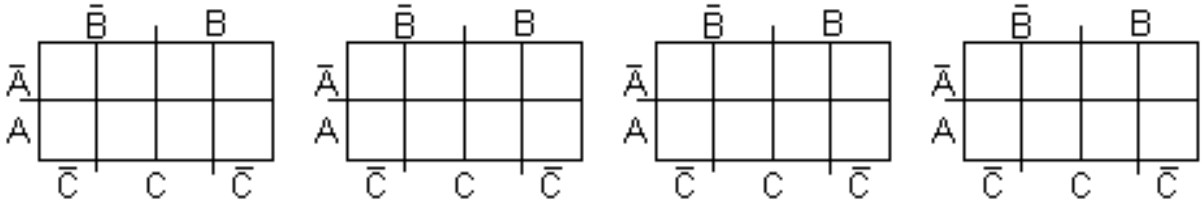
d. $\overline{A+\overline{C+\overline{\overline{B}}}+(\overline{A.B})}$

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

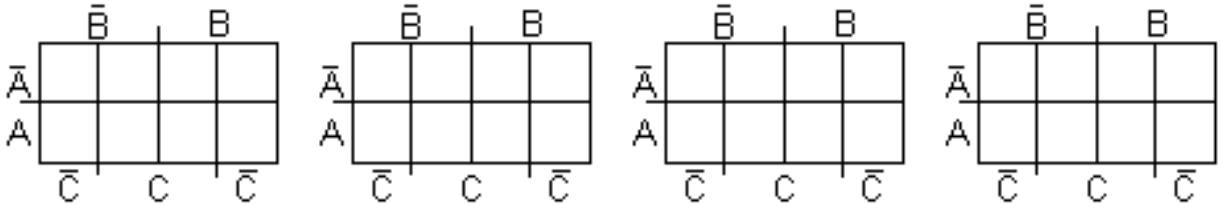
4)

5) Representar as expressões abaixo em mapas de Karnaugh e obter a expressão simplificada:

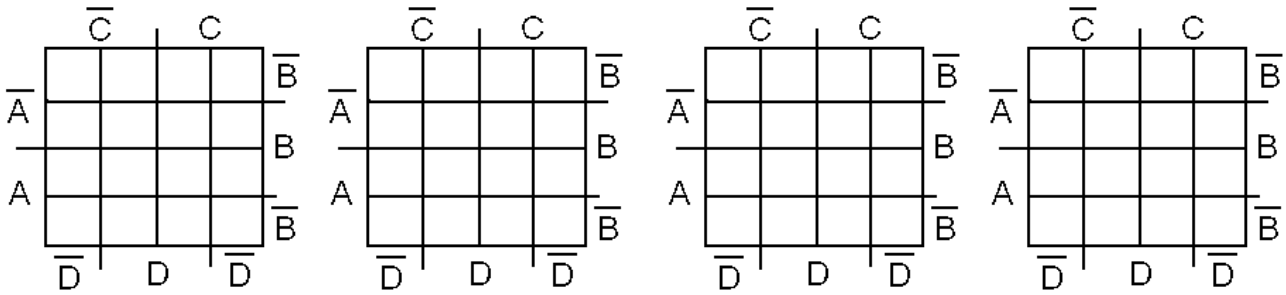
a) $\overline{AC} + B(\overline{A + C}) + (\overline{AB})(\overline{BC})$



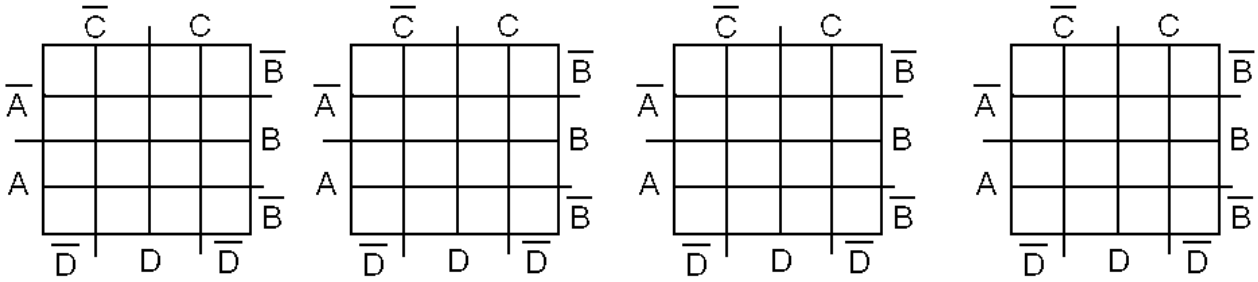
b) $[\overline{\overline{B}.\overline{C + A}) + \overline{A}(\overline{B + C})}]B + \overline{AB}C$



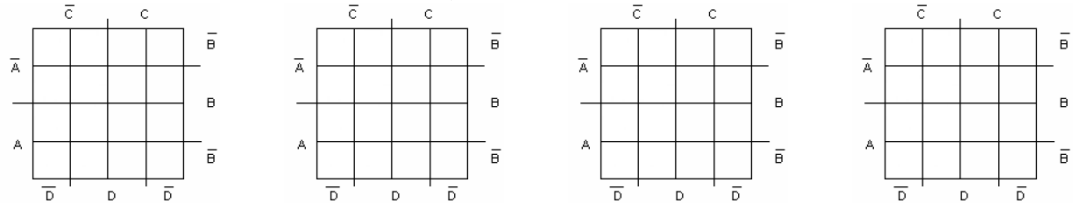
c) $\overline{\overline{A\overline{BC}} + \overline{ABD}}$



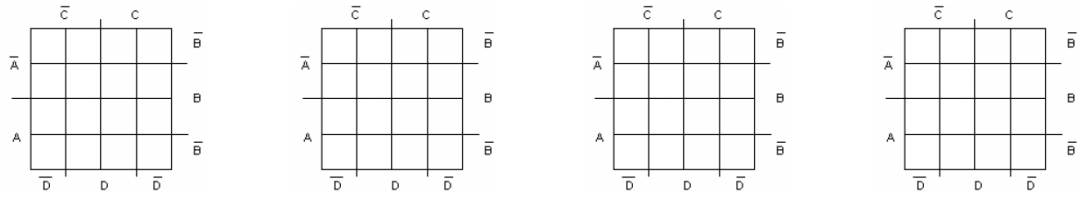
d) $\overline{A + \overline{C + \overline{B}} + C + \overline{D + B + \overline{A}}}$



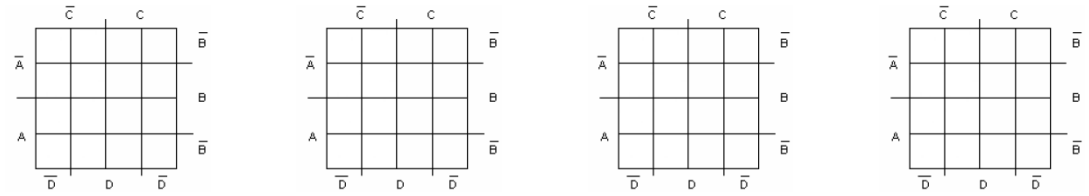
e) $\overline{A.C} + \overline{B} + (\overline{A.C}) + (\overline{AB}) + (\overline{BCD})$



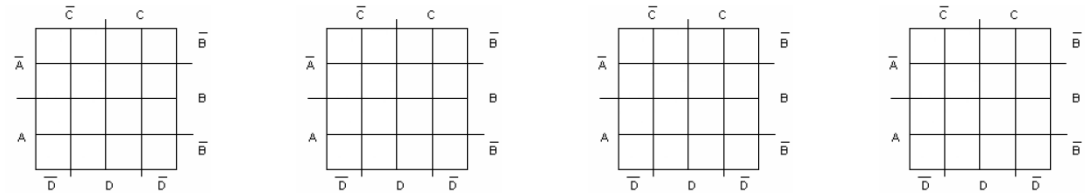
f) $[\overline{\overline{B}.(\overline{C + D}) + \overline{A} + (\overline{B.C})}].B + \overline{A.B}.C$



g) $\overline{\overline{A.\overline{B}.C} + \overline{A+B+D}}$



h) $\overline{\overline{A.C.\overline{B}} + C + D + \overline{B + A}}$



6) Para cada tabela verdade abaixo, projete um circuito lógico que se comportará de acordo com a tabela-verdade (obs.: utilize a álgebra booleana para obter o circuito mais simples)

a)

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

b)

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

c)

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

d)

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