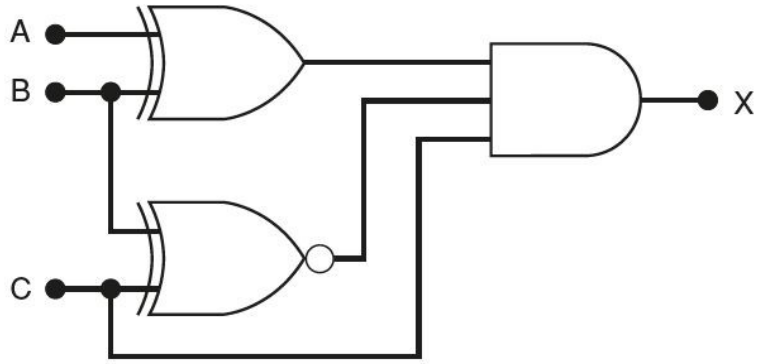
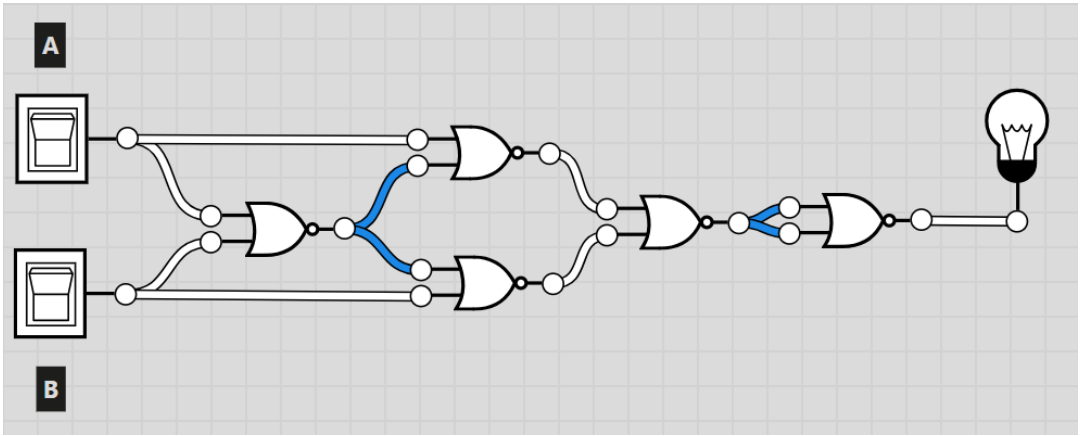
1. Determine as condições de entrada necessárias para gerar uma saída x = 1 no circuito abaixo. Exiba a Tabela Verdade.



A	**B**	**C**	$S=(A \oplus B)$	$Q=\overline{(B \oplus C)}$	**X = S.Q.C**
0	0	0	0	1	0
0	0	1	0	0	0
0	1	0	1	0	0
0	1	1	1	1	1
1	0	0	1	1	0
1	0	1	1	0	0
1	1	0	0	0	0
1	1	1	0	1	0

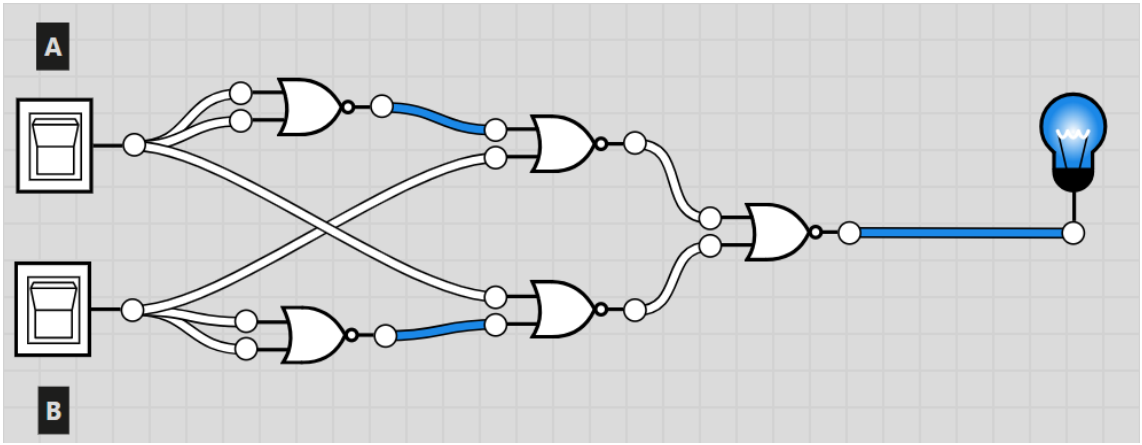
2. A porta NOR é universal, ou seja, é possível criar um circuito que represente qualquer lógica combinatória utilizando apenas esta porta. Assim, resolva os exercícios abaixo:

a) Crie um circuito que representa a operação XOR, apenas utilizando Portas NOR. Exiba a Tabela Verdade do circuito criado;



A	**B**	$S=\overline{(A+B)}$	$Q=\overline{(S+A)}$	$R=\overline{(S+B)}$	$T=\overline{(Q+R)}$	**X**
0	0	1	0	0	1	0
0	1	0	1	0	0	1
1	0	0	0	1	0	1
1	1	0	0	0	1	0

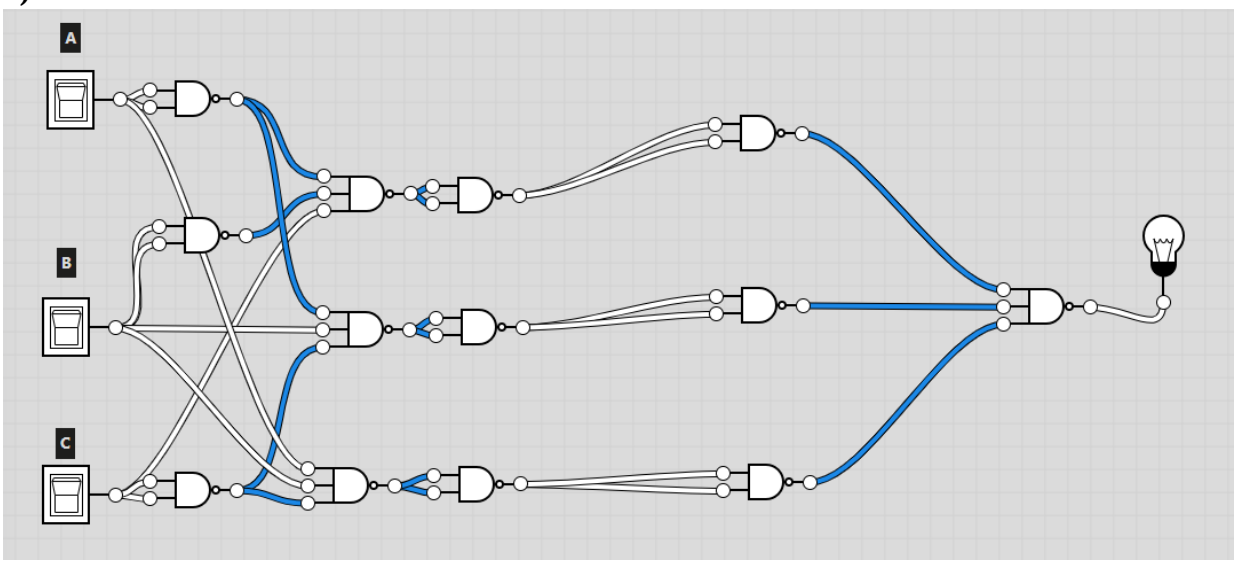
b) Crie um circuito que representa a operação XNOR, apenas utilizando Portas NOR. Exiba a Tabela Verdade do circuito criado.



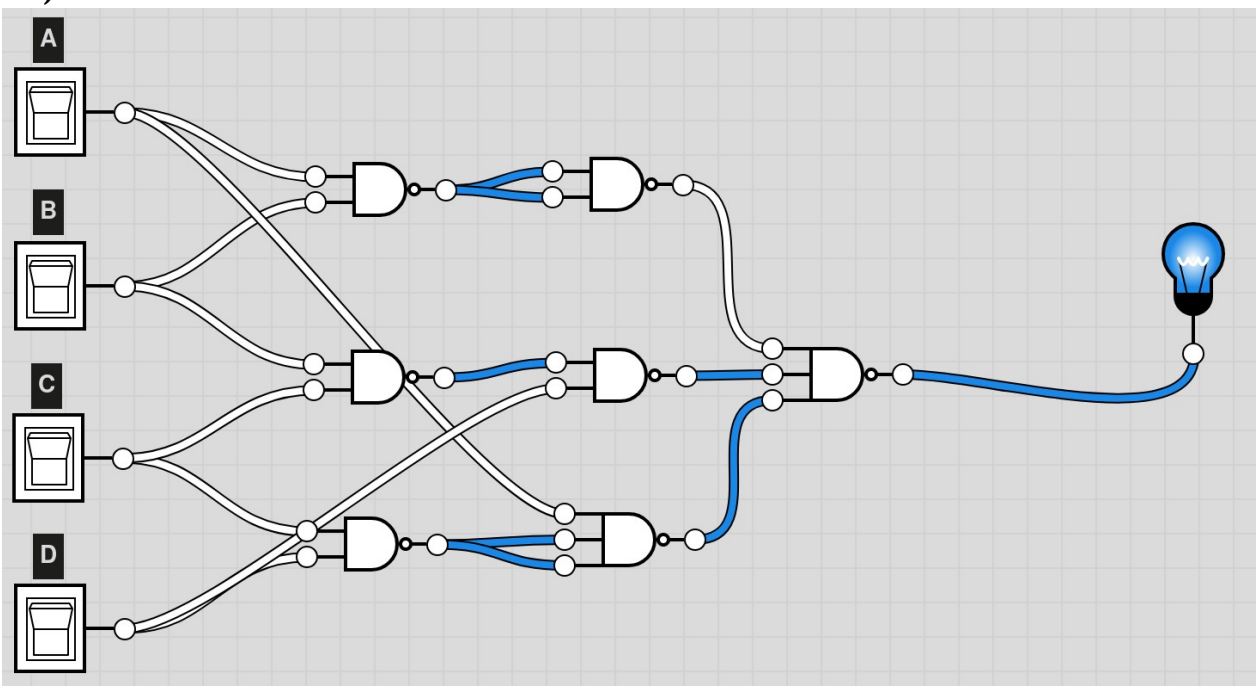
A	**B**	$S=\overline{(A+A)}$	$Q=\overline{(B+B)}$	$R=\overline{(Q+A)}$	$T=\overline{(S+B)}$	**X**
0	0	1	1	0	0	1
0	1	1	0	1	0	0
1	0	0	1	0	1	0
1	1	0	0	0	0	1

3. Construa um circuito somente com portas NAND

a) $S=\overline{AB}\,C+\overline{A}\,B\overline{C}+AB\overline{C}$

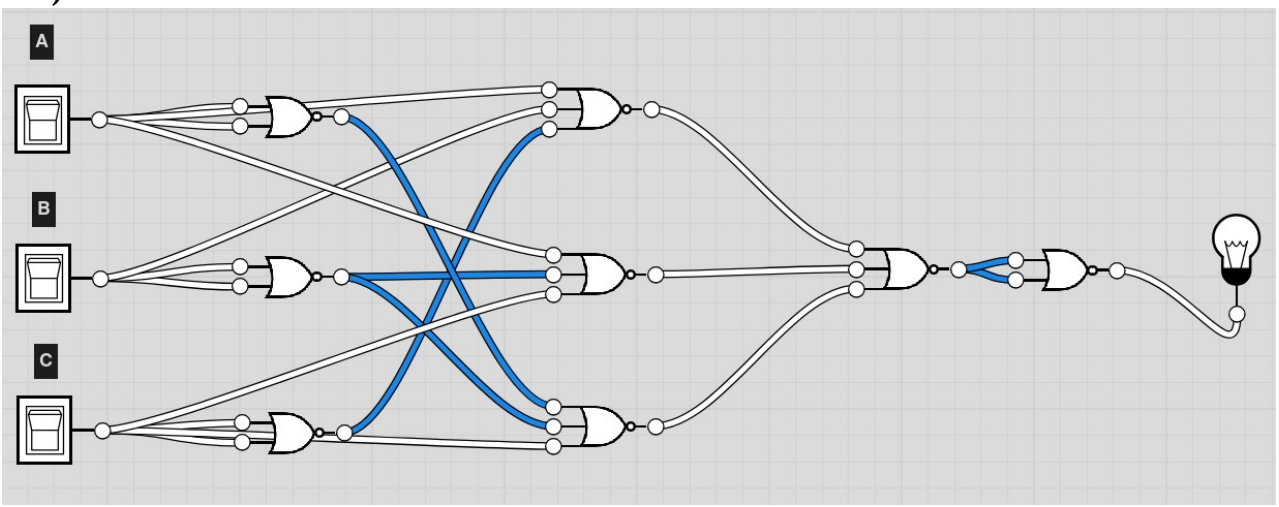


b) $S=\overline{AB}+A\,\overline{CD}+BC\,\overline{D}$

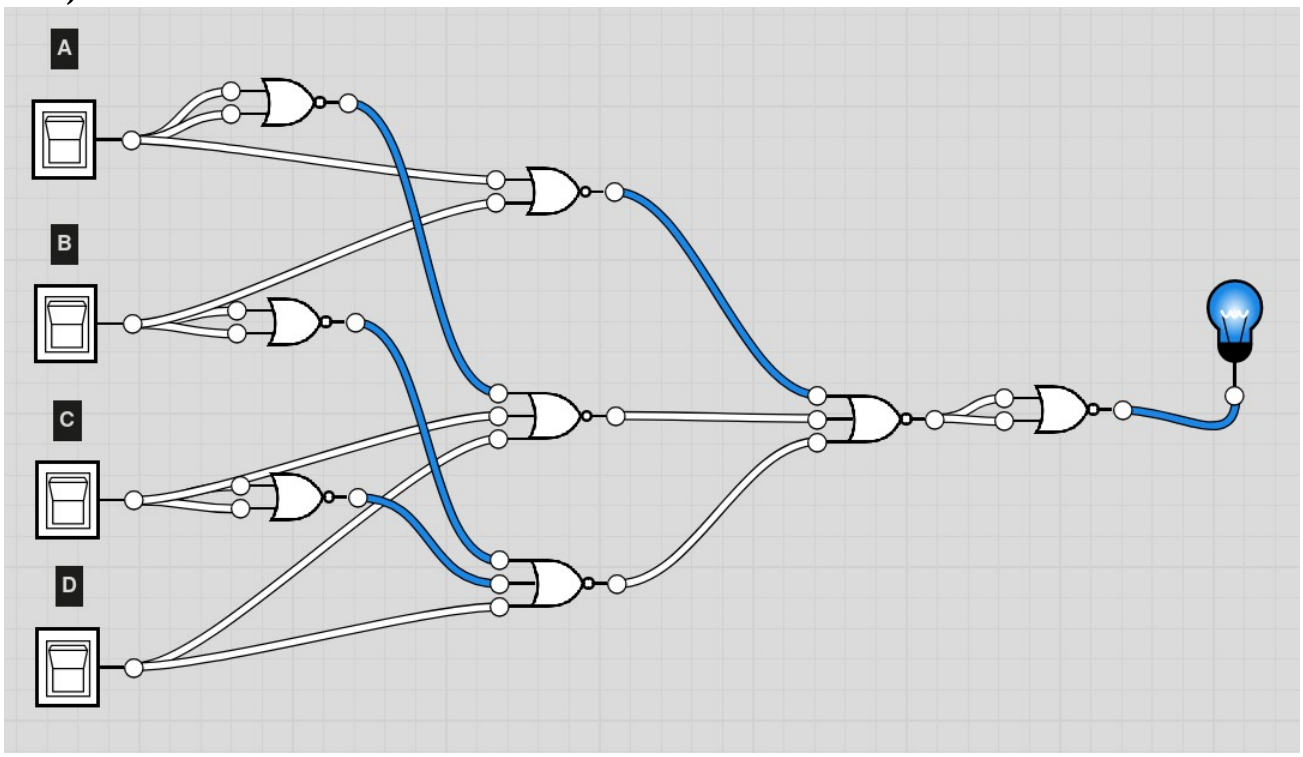


4. Construa um circuito somente com portas NOR

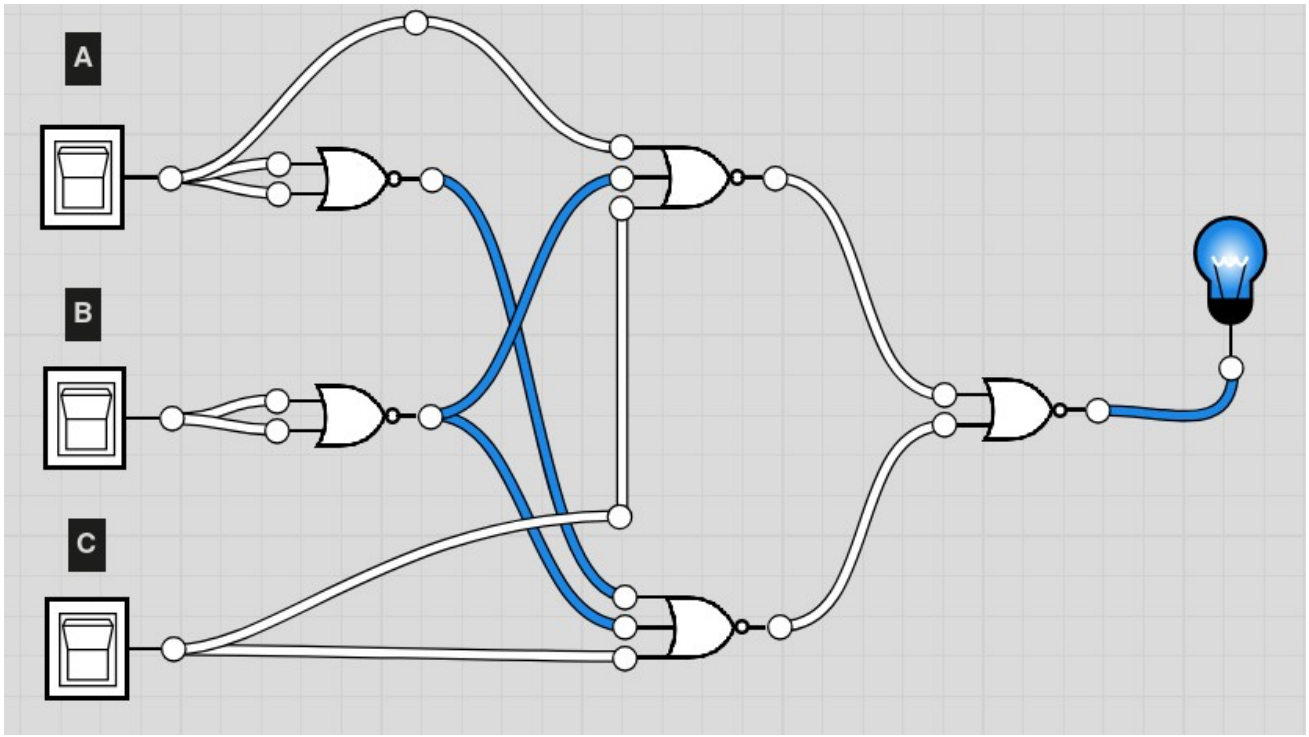
a) $S=\overline{AB}\,C+\overline{A}\,B\,\overline{C}+AB\overline{C}$



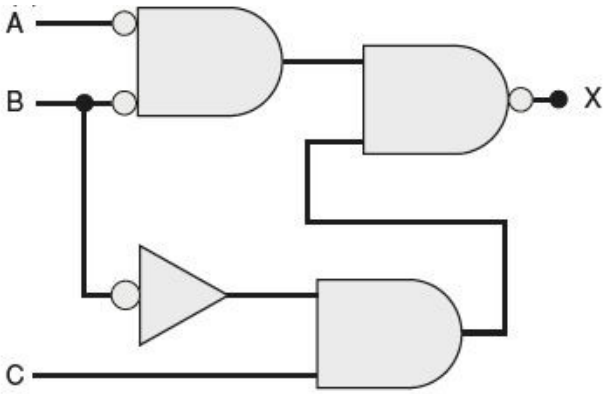
b) $S=\overline{AB}+A\,\overline{CD}+BC\,\overline{D}$



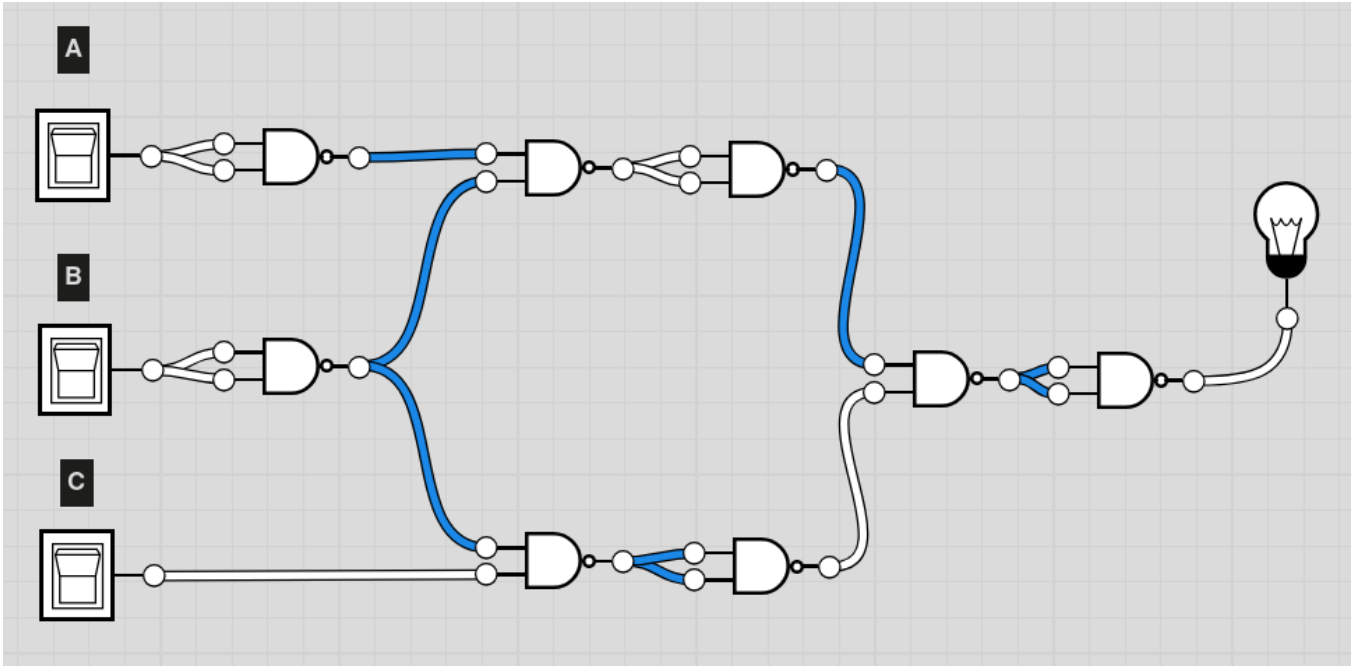
c) $S=\overline{(\overline{A}+B+\overline{C})}.(\overline{A}+\overline{B}+C)$



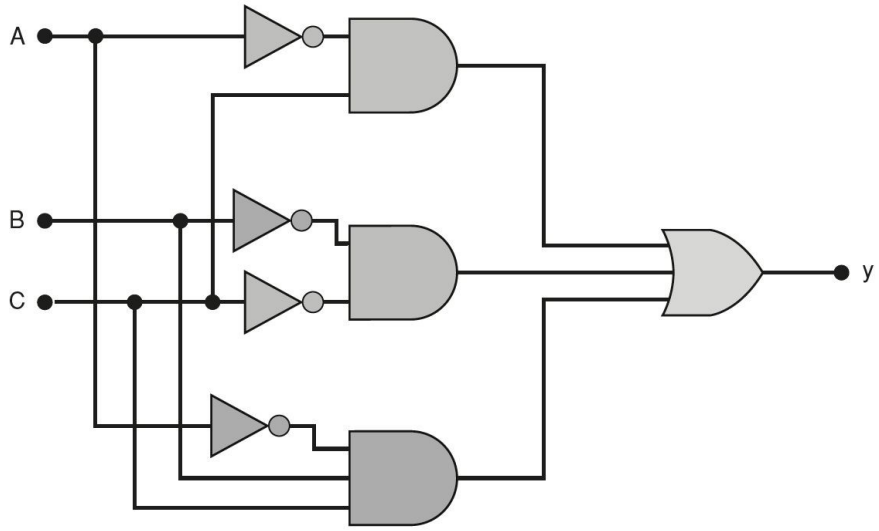
5. Determine a expressão booleana e construa um circuito somente com portas NAND



$x=\overline{(\overline{AB}).(\overline{B}C)}$



6. Determine a expressão booleana e construa um circuito somente com portas NAND



$y=(\overline{A}C)+(\overline{BC})+(\overline{A}BC)$