

Clase 2 - Puertas lógicas

Las más importantes se muestran en la siguiente tabla: sea posible construir.

Nombre de la puerta	Equivalencia eléctrica y símbolo lógico: a) Equivalente eléctrico b) Símbolo ANSI c) Símbolo lógico tradicional			Tabla de verdad y función lógica																
Puerta NOT	a)	b)	c)	 $s = \bar{a}$	<table border="1" style="font-size: small;"> <thead> <tr style="background-color: #008080; color: white;"> <th>a</th> <th>s</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>X</td> </tr> <tr> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> </tr> </tbody> </table>	a	s	A	X	0	1	1	0							
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A	X																			
0	1																			
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Puerta OR (O)	a)	b)	c)	 $s = a + b$	<table border="1" style="font-size: small;"> <thead> <tr style="background-color: #008080; color: white;"> <th>a</th> <th>b</th> <th>s</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	a	b	s	0	0	0	0	1	1	1	0	1	1	1	1
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Puerta AND (Y)	a)	b)	c)	 $s = a \cdot b$	<table border="1" style="font-size: small;"> <thead> <tr style="background-color: #008080; color: white;"> <th>a</th> <th>b</th> <th>s</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	a	b	s	0	0	0	0	1	0	1	0	0	1	1	1
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Puerta X-OR (OR exclusiva)	a)	b)	c)	 $s = a \cdot \bar{b} + \bar{a} \cdot b$	<table border="1" style="font-size: small;"> <thead> <tr style="background-color: #008080; color: white;"> <th>a</th> <th>b</th> <th>s</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> </tr> </tbody> </table>	a	b	s	0	0	0	0	1	1	1	0	1	1	1	0
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Puerta NOR (No O)	a)	b)	c)	 $s = \overline{a + b}$	<table border="1" style="font-size: small;"> <thead> <tr style="background-color: #008080; color: white;"> <th>a</th> <th>b</th> <th>s</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> </tr> </tbody> </table>	a	b	s	0	0	1	0	1	0	1	0	0	1	1	0
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1	1	1																		

Ejercicio N° 1

Completar la siguiente tabla

A	B	AND	NAND	OR	NOR	XOR
0	0					
0	1					
1	0					
1	1					

Ejercicio N°2

Verificar mediante las tablas de verdad de las compuertas las leyes de De Morgan:

$$\overline{AB} = \overline{A + B}$$

$$\overline{A + B} = \overline{A} \cdot \overline{B}$$

A	B	AB	\overline{AB}	\overline{A}	\overline{B}	$\overline{A + B}$
0	0					
0	1					
1	0					
1	1					

A	B	A + B	$\overline{A + B}$	\overline{A}	\overline{B}	$\overline{A} \cdot \overline{B}$
0	0					
0	1					
1	0					
1	1					