Multiprocesamiento

Tarea N°2

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1. Reduzca las funciones, colocar las leyes y una vez de reducidas las funciones graficar ambos diagramas y la tabla de verdad.

1. $A\bar{B}C + \bar{A}'\bar{B}'\bar{C}' + \bar{A}'\bar{B}'C + \bar{A}BC + A\bar{B}\bar{C} + A\bar{B}C$

$A\bar{B}C + A\bar{B}\bar{C} + \bar{A}\bar{B}(\bar{C}+C) + \bar{A}BC + A\bar{B}C \rightarrow$ Distributiva.

$BC(A+\bar{A}) + \bar{A}\bar{B}(\bar{C}+C) + A\bar{B}\bar{C} + \bar{A}BC + A\bar{B}C \rightarrow$ Distributiva.

$BC(1) + \bar{A}\bar{B}(1) + A\bar{B}\bar{C} + \bar{A}BC + A\bar{B}C \rightarrow$ Complemento.

$BC(C+1) + \bar{A}\bar{B} + A\bar{B}\bar{C} + \bar{A}\bar{B}C \rightarrow$ Distributiva

$BC + \bar{A}\bar{B} + \bar{A}\bar{B}(C+\bar{C}) \rightarrow$ Distributiva y complemento.

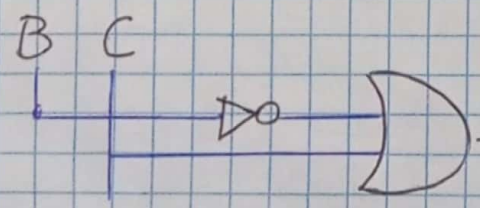
$BC + \bar{A}\bar{B} + A\bar{B} \rightarrow$ Complemento.

$BC + \bar{B} \rightarrow$ Absorción

$C + \bar{B} \rightarrow$ Absorción.

Diagramas.

Compuertas lógicas



Circuitos.

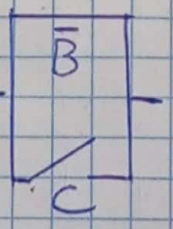


Tabla de verdad.

B	C	$\bar{B}$	$\bar{B}+C$
0	0	1	1
0	1	1	1
1	0	0	0
1	1	0	1

2 $\bar{X}\bar{Y}\bar{Z} + \bar{X}\bar{Y}Z + \bar{X}Y\bar{Z} + \bar{X}YZ + X\bar{Y}\bar{Z} + X\bar{Y}Z = \bar{X} + \bar{Y}$

$\bar{X}\bar{Y}(\bar{Z}+Z) + \bar{X}Y(Z+\bar{Z}) + X\bar{Y}(\bar{Z}+Z) \rightarrow$ Distributiva.

$\bar{X}\bar{Y} + \bar{X}Y + X\bar{Y} \rightarrow$ Complemento e identidad.

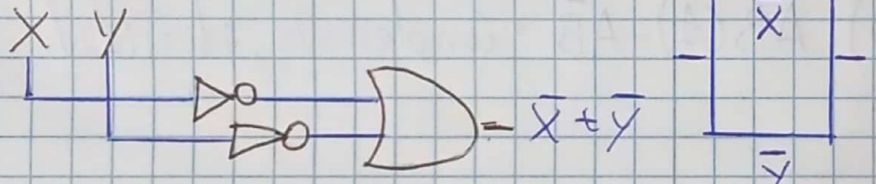
$\bar{X}(\bar{Y}+Y) + X\bar{Y} \rightarrow$ Distributiva.

$\bar{X} + X\bar{Y} \rightarrow$ Complemento e identidad.

$\bar{X} + \bar{Y} \rightarrow$ Absorción.

Diagramas

Compuertas



Circuitos

Tabla.

X	Y	$\bar{X}$	$\bar{Y}$	$\bar{X}+\bar{Y}$
0	0	1	1	1
0	1	1	0	1
1	0	0	1	1
1	1	0	0	0

3. $F = AB + \overline{(AC)} + A\bar{B}C(AB+C)$

$AB + \overline{AC} + A\bar{B}C \cdot AB + A\bar{B}CC \rightarrow$ Distributiva.

$AB + \overline{AC} + A\bar{B}C \rightarrow$ Complementario $X+\bar{X}=0$, Idempotencia $X*X=X$

$A(B+\bar{B}C) + \overline{AC} \rightarrow$ Distributiva.

$A(B+C) + \overline{AC} \rightarrow$ Absorción.

$AB + AC + \overline{AC} \rightarrow$ Distributiva

$AB + 1 \rightarrow$ Complementario $X+\bar{X}=1$

$1 \rightarrow$ Identidad $X+1=1$

4. $F(A,B,C,D) = \overline{(A\bar{B} + \bar{A}\bar{D} + B\bar{D} + \bar{A}B + C\bar{D}A + \bar{A}D + C\bar{D})} + \bar{A}\bar{B}\bar{D}$

$= \overline{(B + \bar{A} + B\bar{D} + C\bar{D})} + \bar{A}\bar{B}\bar{D}$ → Distributiva.

Complemento $X + \bar{X} = 1$

Identidad $X + 1 = 1$.

Absorción. $X + \bar{X}Y = X + Y$

$= (B + \bar{D} + C\bar{D} + \bar{A}) + \bar{A}\bar{B}\bar{D}$

$= \overline{(B + \bar{D} + A)} + \bar{A}\bar{B}\bar{D}$ → Distributiva, complemento, identidad.

$= \bar{A}\bar{B}D + \bar{A}\bar{B}\bar{D}$ → Negación ley de morgan.

$= \bar{A}\bar{B}(\bar{D} + D) = \bar{A}\bar{B}(1) = \bar{A}\bar{B}$ → Complemento, identidad.

(Circuitos) Diagramas

Compuertas

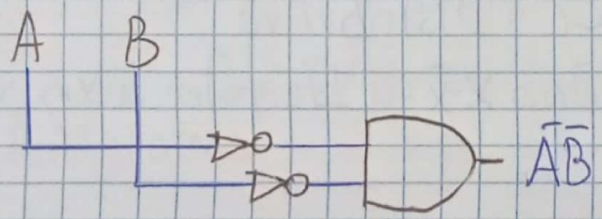
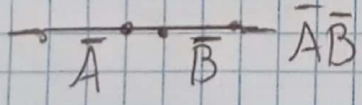


Tabla de verdad

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

Circuitos



4. $F(A,B,C,D) = \overline{(AB + A\bar{D} + B\bar{D} + \bar{A}B + C\bar{D}A + AD + C\bar{D})} + \bar{A}\bar{B}\bar{D}$

$= (\bar{A}+\bar{B}) \cdot (A+D) \cdot (\bar{B}+D) \cdot (A+\bar{B}) \cdot (\bar{C}+D+\bar{A}) \cdot (A+\bar{D}) \cdot (C+D) + \bar{A}\bar{B}\bar{D}$ → ley de bool.

$= (\bar{A}D + A\bar{B} + \bar{B}D) \cdot (A\bar{B} + \bar{B} + AD + \bar{B}D) \cdot (A\bar{C} + \bar{C}\bar{D} + AD + \bar{A}\bar{D}) \cdot (\bar{C}+D)) + \bar{A}\bar{B}\bar{D}$ → Distributiva, Complementario.

$= (\bar{A}\bar{B}D + A\bar{B} + A\bar{B}D + \bar{B}D) \cdot (A\bar{C} + A\bar{C}D + \bar{C}\bar{D} + AD + \bar{A}\bar{C}\bar{D}) + \bar{A}\bar{B}\bar{D}$

↳ Distributiva, complementario, idempotencia, $x+x=x$, $x \cdot \bar{x} = 0$

$= (\bar{A}\bar{B}D + A\bar{B} + A\bar{B}D + \bar{B}D) \cdot (A\bar{C} + A\bar{C}D + \bar{C}\bar{D} + AD + \bar{A}\bar{C}\bar{D}) + \bar{A}\bar{B}\bar{D}$

$= \bar{A}\bar{B}\bar{C}\bar{D}(A\bar{B}\bar{C} + A\bar{B}\bar{C}D + A\bar{B}\bar{C}\bar{D} + A\bar{B}\bar{D})$

$= (A\bar{B} + \bar{B}D) \cdot (A\bar{C} + \bar{C}\bar{D} + AD) + \bar{A}\bar{B}\bar{D}$

↳ Distributivo, Complementario, Identidad.

↳ Distributivo, Identidad.

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

$A\bar{B}\bar{C} + A\bar{B}D + \bar{A}\bar{B}\bar{D}$.