Pag 259

Sección 4.2 Leyes y reglas del algebra booleana.

7. Identificar la ley del algebra de Boole en que esta basada cada una de las sgt. igualdades.

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

R/ Leyes conmutativas $\Rightarrow A+B = B+A$

(b) $AB\bar{C}D + \overline{AB\bar{C}} = D\bar{C}BA + \overline{\bar{C}BA}$

R/ Leyes de conmutatividad $\Rightarrow A \cdot B = B \cdot A$

(c) $AB(CD + E\bar{F} + GH) = ABCD + ABE\bar{F} + ABGH$

R/ leyes distributivas $\Rightarrow A \cdot (B+C) = AB + AC$

8. Identificar Reglas del algebra de boole

(a) $\overline{\overline{AB+CD}} + C\bar{F} = AB + CD + E\bar{F}$

R/ ley de involución

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

$0 \cdot B + AB\bar{C} + A \cdot 0 = AB\bar{C}$

R/ Ley de complemento y acotación

8)

c) $A(BC+B\bar{C})+AC = A(B(C+\bar{C}))+AC$

R/ Idempotencia

d) $AB(C+\bar{C})+AC = AB+AC$

R/ Ley de complemento.

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

R/ Ley de involución

f) $ABC+\overline{AB}+\overline{ABCD} = ABC+\overline{AB}+D$

R/ Leyes de Morgan.

4.3 9) Aplicar teorema de Morgan.

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

$\Rightarrow \bar{A}+B+\bar{C}D$ //

(b) $\overline{\bar{A}B} = \bar{\bar{A}}+\bar{B} = A+\bar{B}$ //

c) $\overline{A+B+C} = \bar{A}\cdot\bar{B}\cdot\bar{C}$ //

d) $\overline{ABC} = \bar{A}+\bar{B}+\bar{C}$

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

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

g) $\overline{\bar{A}B+C\bar{D}} = \overline{AB}\cdot\overline{\bar{C}D} = \bar{A}+\bar{B}\cdot\bar{C}+\bar{D}$

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

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

4-3 10) Aplicar Morgan a cada expresión

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

$\Rightarrow \bar{A}+B+\bar{C}D$ //

(b) $\overline{AB(CD+\bar{E}F)} \Rightarrow \overline{AB} + \overline{(CD+\bar{E}F)} \Rightarrow \bar{A}+\bar{B}+(\overline{CD}\,\overline{\bar{E}F})$

$\Rightarrow \bar{A}+\bar{B}+(\bar{C}+\bar{D})(\bar{\bar{E}}+\bar{F})$

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

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

D) $\overline{(\bar{A}+B+C+D)}\,\overline{(A\bar{B}C\bar{D})} \Rightarrow \overline{(\bar{A}+B+C+D)} + \overline{(A\bar{B}C\bar{D})}$

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

e) $\overline{A\bar{B}(CD+\bar{E}F)(\bar{A}B+\bar{C}\bar{D})} \Rightarrow \overline{A\bar{B}} + \overline{(CD+\bar{E}F)} + \overline{(\bar{A}B+\bar{C}\bar{D})}$

$\Rightarrow AB + (\overline{CD}\cdot\overline{\bar{E}F}) + (\overline{A\bar{B}}\cdot\overline{\bar{C}\bar{D}}) \Rightarrow AB + (\bar{C}+\bar{D}\cdot\bar{\bar{E}}+\bar{F}) + ABD$

$\Rightarrow AB + ABCD + (\bar{C}+\bar{D}\cdot E+\bar{F}) \Rightarrow AB + (\bar{C}+\bar{D})(E+\bar{F})$

43 11) Aplicar Morgan a los sgt:

a) $\overline{(ABC)(EFG)} + \overline{(HIJ)(KLM)}$

$\Rightarrow \overline{(ABC)(EFG)}\ \overline{(HIJ)(KLM)} \Rightarrow (\overline{ABC})(\overline{EFG})(\overline{HIJ})(\overline{KLM})$

$\Rightarrow (\bar{A}+\bar{B}+\bar{C})(\bar{E}+\bar{F}+\bar{G})(\bar{H}+\bar{I}+\bar{J})(\bar{K}+\bar{L}+\bar{M})$

b) $\overline{(A+\overline{B\bar{C}}+CD)} + \overline{\overline{BC}} \Rightarrow (\bar{A}\cdot\overline{\overline{B\bar{C}}}\cdot\overline{CD}) + BC$

$\Rightarrow (\bar{A}\cdot B\bar{C}\cdot\overline{C\bar{D}}) + BC \Rightarrow (\bar{A}\cdot B\bar{C}\cdot(\bar{C}+\bar{D})) + BC$

c) $\overline{(\bar{A}+B)(\overline{C+D})(\overline{E+F})(\overline{G+H})} \Rightarrow (\overline{A+B})(\overline{C+D})(\overline{E+F})(\overline{G+H})$

$\Rightarrow (\bar{A}\cdot\bar{B})(\bar{C}\cdot\bar{D})(\bar{E}\cdot\bar{F})(\bar{G}\cdot\bar{H})$

Brayan Maldonado Carrasco.