CONCLUSIONS

A) Take the inputs, consider their interactions and test points, and then evaluate the output

B) Pain

C) Finding the test points was much more tedious, but made it easier in the end.

D) Same as much, equations can be easier even if they're not identical

$$A + B = A\bar{B} + \bar{A}B$$

These will always be the same!

11/5/24

2.1.4 Circuit Simplification Boolean Algebra A-22

③ $F_3 = \bar{R}T + (R+\bar{S})(\bar{R}+T)$

R	T	S	F_3
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

	R	S
$\bar{R}$	$R\bar{R}$	$\bar{R}\bar{S}$
T	RT	T$\bar{S}$

$$F_3 = \bar{R}T + R\bar{R} + \bar{R}\bar{S} + RT + T\bar{S}$$

$$F_3 = T(\bar{R}+R) + R\bar{R} + \bar{R}\bar{S} + T\bar{S}$$

$$F_3 = T + \bar{R}\bar{S} + T\bar{S}$$

$$F_3 = T(1+S) + \bar{R}\bar{S}$$

$$F_3 = T + \bar{R}\bar{S}$$

Th. 16   Th. 17   Th. 18   Th. 19

$X + \bar{X}Y = X+Y$ $X + \bar{X}\bar{Y} = X+\bar{Y}$ $\bar{X} + XY = \bar{X}+Y$ $\bar{X} + X\bar{Y} = \bar{X}+\bar{Y}$

④ $F_4 = PS + P\bar{Q}\bar{S} + PQS$

$= P(S + \bar{Q}\bar{S}) + PQS$

$= P(S + \bar{Q}) + PQS$

$= PS + P\bar{Q} + PQS$

$= PS(1+Q) + P\bar{Q}$

$= PS + P\bar{Q} = P(S+\bar{Q})$

Boolean Theorems Summary

1) $X \cdot 0 = 0$
2) $X \cdot 1 = X$
3) $X \cdot X = X$
4) $X \cdot \bar{X} = 0$
5) $X + 0 = X$
6) $X + 1 = 1$
7) $X + \bar{X} = 1$
8) $X + X = X$

9) $\bar{\bar{X}} = X$
10) $X \cdot Y = Y \cdot X$ ⎫ Commutative
11) $X + Y = Y + X$ ⎭ Law
12) $X(YZ) = (XY)Z$ ⎫ Associative
13) $X + (Y+Z) = (X+Y)+Z$ ⎭ Law
14) $X(Y+Z) = XY + XZ$ ⎫
15) $(X+Y)(W+Z) = XW+XZ+YW+YZ$ ⎭ Distributive Law

16) $X + \bar{X}Y = X+Y$ ⎫
17) $X + \bar{X}\bar{Y} = X+\bar{Y}$ ⎬ Consensus
18) $\bar{X} + XY = \bar{X}+Y$ ⎪ Theorem
19) $\bar{X} + X\bar{Y} = \bar{X}+\bar{Y}$ ⎭

11/7/24

Signature: _[signature]_   Date: 11/8/24   Team Members:

Witness: Date: