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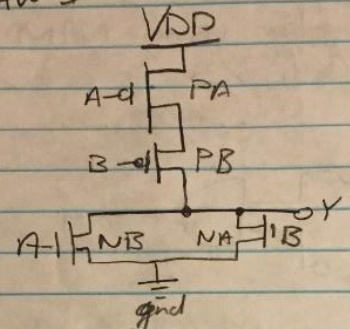
CSE 140
Prof. Rosing

CSE 140 HW 1

1)



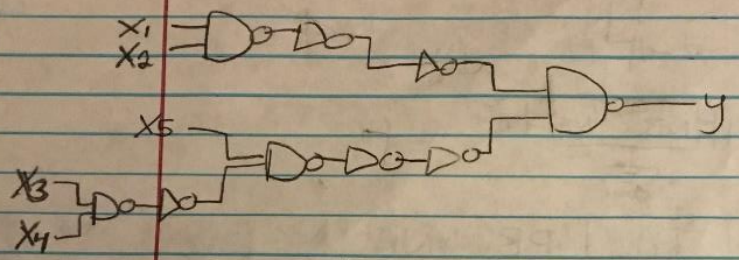
A	B	PA	PB	NA	NB	Y
0	0	ON	ON	off	off	1
0	1	ON	Off	off	on	0
1	0	off	ON	on	off	0
1	1	Off	off	on	on	0

2) Simplify:

i) $xy + zy + z'y + x'$ Given
$xy + y(z'+z) + x'$ - Distributive
$xy + y(1) + x'$ - Complement
$xy + y + x'$ - Identity

ii) $(xy)'(x'+x)(y'+x)$ Given
$(xy)'(1)(y'+x)$ - Complement
$(xy)'(y'+x)$ - Identity
$(x'+y')(y'+x)$ - De Morgan's
$x'y' + x'x + y'y' + y'x$ - distributive
$x'y' + 0 + y'y' + y'x$ - Complement
$x'y' + y' + y'x$ - Idempotent
$y' + x'y' + y'x$ - reorder
$y' + y'(x'+x)$ - distributive
$y' + y'(1) \Rightarrow y'$ - Complement, idempotent

3) Design a logic function using NAND & inverters
$(X1)(X2) + ((X3)(X4))\ X5$



4)

Truth Table

a_2	a_1	a_0	y
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

Boolean Eq

$(a_0 \otimes a_1) \otimes a_2$