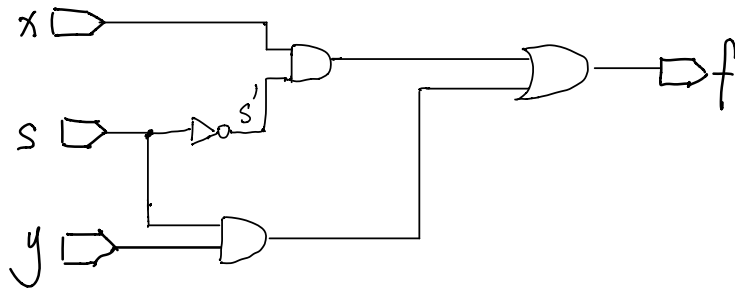Last Name: TANG   First Name: SIWEI

Student #: 10040245 48

Part I: $f = xs' + ys$

1. Draw the gate diagram, use only AND, OR and NOT gates.
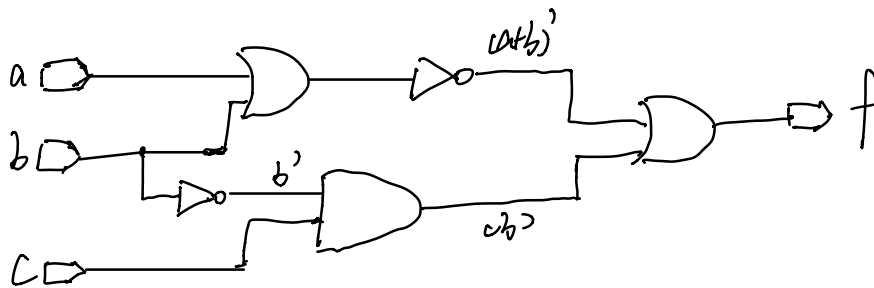

2. Write Truth table

x	y	s	s'	xs'	ys	f
0	0	0	1	0	0	0
0	0	0	1	1	0	1
1	0	0	1	1	0	1
1	1	1	0	0	0	0
1	0	0	1	0	0	0
0	1	1	0	0	1	1
0	1	1	0	0	0	0
0	1	1	0	0	1	1

Part II $f = (a+b)' + cb'$

1. Draw the gate diagram, use AND, OR and NOT gate.

2. Write Truth Table

a	b	c	b'	(a+b)'	cb'	f
0	0	0	1	1	0	1
0	0	1	0	1	1	1
0	1	0	1	0	0	0
0	1	1	0	0	0	0
1	0	0	1	0	0	0
1	0	1	0	0	1	1
1	1	0	1	0	0	0
1	1	1	0	0	0	0

3. Simplify the Boolean expression

Draw gate diagram and write Truth table

res. $f = (a+b)' + cb' = a' \cdot b' + cb'$ (by DeMorgan's law)

$= b'(a'+c)$ (by Distributive law)
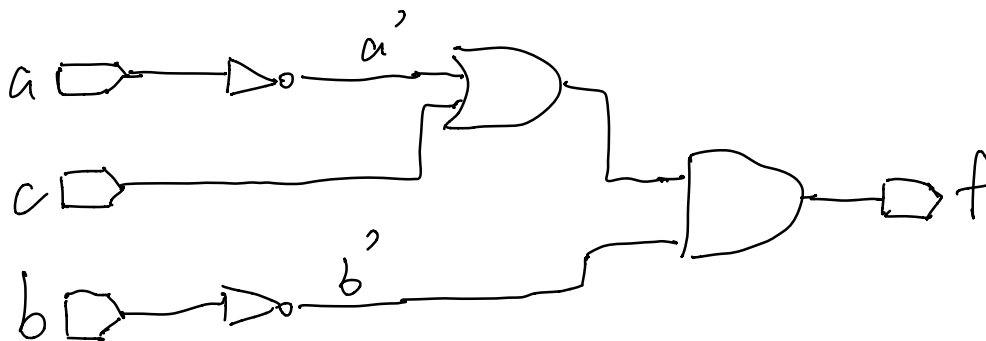
a	b	c	a'	b'	(a'+c)	f
0	0	0	1	1	1	1
0	0	1	1	1	1	1
0	1	0	1	0	1	0
0	1	1	1	0	1	0
1	0	0	0	1	0	0
1	0	1	0	1	1	1
1	1	0	0	0	0	0
1	1	1	0	0	1	0