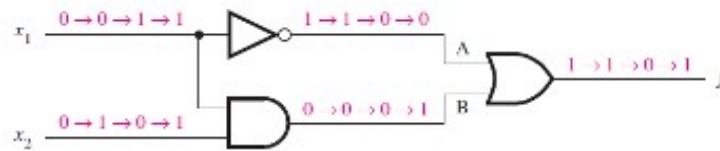


Homework 1: EE 252 Digital Electronics

Problems from Textbook:

1. 1.1
2. 1.4
3. 1.6
4. 1.8

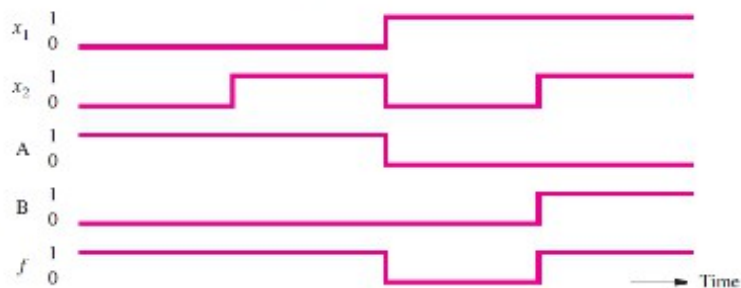
5.- Verify that the logic circuits in (a) and (d) are equivalent. (Find the expression for f in both cases and show they are equivalent from truth tables.



(a) Network that implements $f = \bar{x}_1 + x_1 \cdot x_2$

(b) Truth table

x_1	x_2	$f(x_1, x_2)$	A	B
0	0	1	1	0
0	1	1	1	0
1	0	0	0	0
1	1	1	0	1

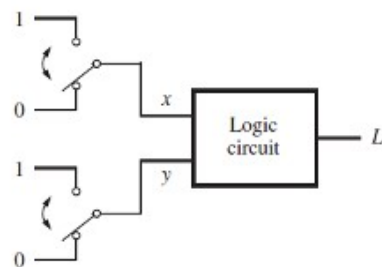


(c) Timing diagram



(d) Network that implements $g = \bar{x}_1 + x_2$

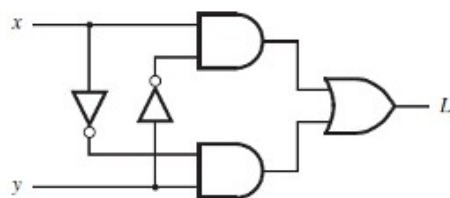
6.- Verify that the logic circuit in (c) is represented by the truth table in (b)



(a) Two switches that control a light

x	y	L
0	0	0
0	1	1
1	0	1
1	1	0

(b) Truth table



(c) Logic network



(d) XOR gate symbol

7.-

***2.7** Determine whether or not the following expressions are valid, i.e., whether the left- and right-hand sides represent the same function.

(a) $\bar{x}_1x_3 + x_1x_2\bar{x}_3 + \bar{x}_1x_2 + x_1\bar{x}_2 = \bar{x}_2x_3 + x_1\bar{x}_3 + x_2\bar{x}_3 + \bar{x}_1x_2x_3$

(b) $x_1\bar{x}_3 + x_2x_3 + \bar{x}_2\bar{x}_3 = (x_1 + \bar{x}_2 + x_3)(x_1 + x_2 + \bar{x}_3)(\bar{x}_1 + x_2 + \bar{x}_3)$

(c) $(x_1 + x_3)(\bar{x}_1 + \bar{x}_2 + \bar{x}_3)(\bar{x}_1 + x_2) = (x_1 + x_2)(x_2 + x_3)(\bar{x}_1 + \bar{x}_3)$