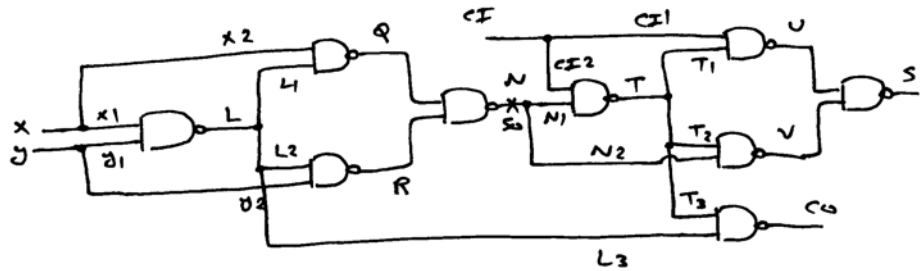


HW#3

Q1



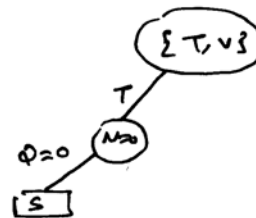
(1) D-Algorithm

Decision Assignments	Implications	D-F	F-F	Comments
	$N=1, N1=D, N2=D$	$\{T, V\}$	$\{N\}$	activate fault
$CI2=1$	$CI=1, CI1=1, T=\bar{D},$ $U=0, V=1, S=\bar{D}$ $T3=\bar{D}$	$\{C0\}$	$\{N\}$	propagate through T
$Q=0$	$x2=1, x=1, x1=1,$ $L1=1, L=1, L2=1, L3=1$ $y1=0, y=0, y2=0,$ $C0=0, R=1$	\emptyset	\emptyset	Q is selected success

So, a test is generated successfully for the fault

as $\{x, y, CI\} = \{1, 0, 1\}$

The decision tree is:

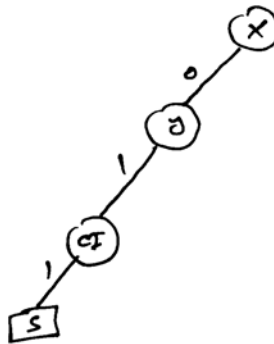


(ii) Podem Algorithm

Objective	PI Assignments	Implications	D-F	Comment
$N=1$	$x=0$	$x_1=0, x_2=0,$ $Q=1, L=1,$ $L_1=1, L_2=1, L_3=1$	\emptyset	Q is selected L_1 is selected x_1 is selected
$N=1$	$y=1$	$y_1=1, y_2=1,$ $R=0, N=1,$ $N_1=0, N_2=0$	$\{T, v\}$	
$CI=1$	$CI=1$	$CI_1=1, T=\bar{D},$ $T_1=\bar{D}, T_2=\bar{D},$ $T_3=\bar{D}, C_0=0,$ $v=1, u=0,$ $S=\bar{D}$	\emptyset	T is selected to propagate the fault Success

So, a test is generated successfully for the fault
as $\{x, y, CI\} = \{0, 1, 1\}$.

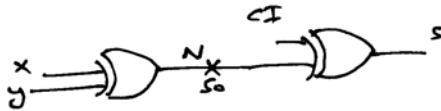
The decision tree is :



(iii) Hitec generates the test

$$\{x, y, cI\} = \{1, 0, 0\}$$

Note that all these tests are valid test sets. The circuit can be simplified into the following for the S function:



So, the set of tests that detect the fault $N = 0$ on the output S is given by the equation $N=1$ because any value on cI will propagate the fault.

$$\Rightarrow \text{Set of tests} = \{01-, 10-\}$$

Thus, there are four possible test vectors for detecting the fault across the output S .

Hitec selected a different vector because it is based on cost functions that will direct the selection criteria.