# ECE 581 Homework 4

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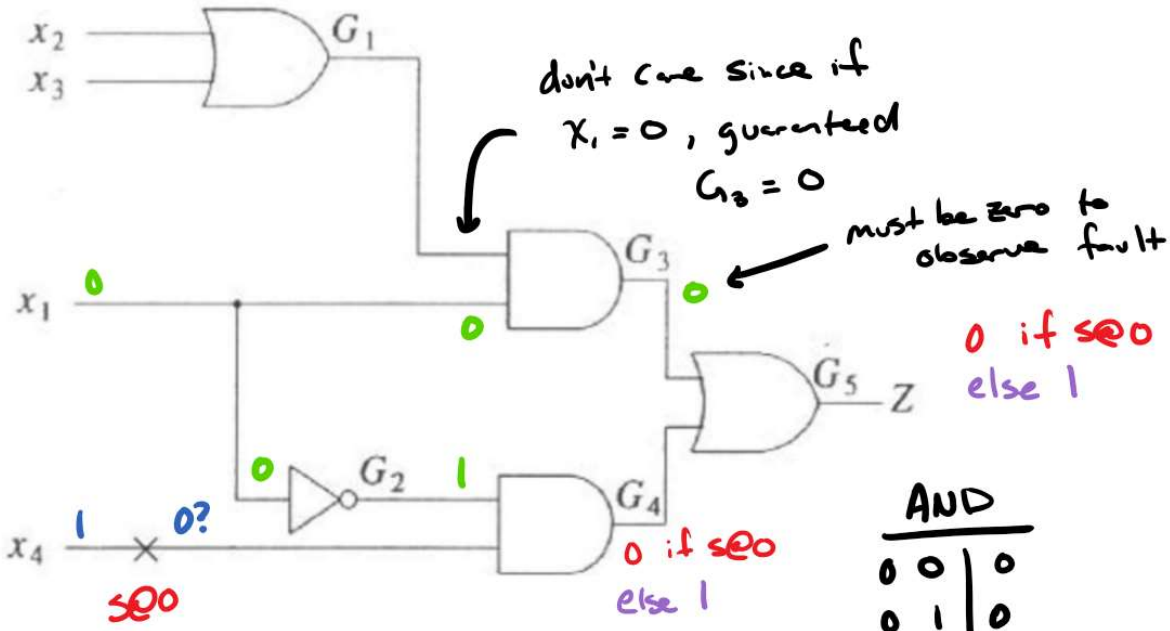
**Problem 1.**
For the following circuit, use the path sensitization approach, derive all the possible input patterns for detecting s-a-0 at $x_4$.




$x_4 = 1$

$(G2 = 1 \ \& \ x_4 = 1) = 1$

if s@0 → G4 = 0

Input vectors $(x_1 x_2 x_3 x_4)$

0XX1

**Possible Input Vectors for detecting s-a-0:**

$\{x_1,x_2,x_3,x_4\}$ =

0001

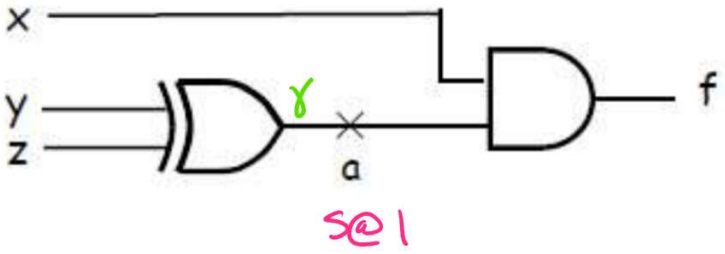
0011

0101

0111

**Problem 2.**

For the following circuit, use the Boolean difference method to determine all the input test vectors to detect the s-a-1 at a.




s@1

$\gamma = 0$ where $\gamma = y \oplus z$

$\bar{\gamma} \wedge \frac{df}{d\gamma} = 1$

$f = x(y \oplus z) = x\gamma$

$\frac{df}{d\gamma} = f_\gamma \oplus f_{\bar{\gamma}}$

$f_\gamma = x \quad f_{\bar{\gamma}} = 0$

$\gamma(x \oplus 0) = 1$

$\gamma(x) = 1$

$(y \oplus z)x = 1$

$(\bar{y}z + y\bar{z})x = 1$

$x\bar{y}z + xy\bar{z} = 1$

101 110

**Input Vectors to test for s-a-1:**

{x,y,z} =

101

110