Name: Key   Id#
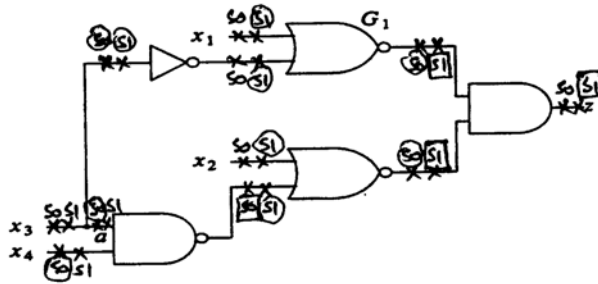
<div style="text-align:center">

COE 464, Term 042

Testing of Digital Circuits

Quiz# 1

Date: Sunday, Feb. 27, 2005

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Q1. Consider the circuit given below:

i. Find a Boolean expression for the set of all tests that detect the fault x3 s-a-0.

ii. Mark on the circuit all the possible **single stuck-at faults** using the symbol **s0** for stuck-at-0 faults and the symbol **s1** for stuck-at-1 faults.

iii. Mark on the circuit all the single stuck-at faults that can be eliminated due to **Fault Equivalence** relation by drawing a <u>circuit</u> a round them.

iv. Mark on the circuit all the single stuck-at faults that can be eliminated due to **Fault Dominance** relation by drawing a <u>square</u> a round them.

(i) $Z = \overline{(x_1 + \bar{x}_3)} \cdot \overline{(x_2 + \overline{x_3 x_4})} = (\bar{x}_1 \cdot x_3) \cdot (\bar{x}_2 \, x_3 \, x_4)$

$\qquad = \bar{x}_1 \, \bar{x}_2 \, x_3 \, x_4$

$Z_f = 0$

Set of all test sets that detect the fault x_3 s-a-0

$= Z \oplus Z_f = \bar{x}_1 \, \bar{x}_2 \, x_3 \, x_4$