National Taiwan University
Department of Electrical Engineering
Introduction to EDA

Homework #4 (Due date see website)

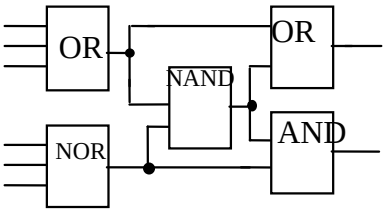
Problem 1: (18 points)

For the circuits shown below find:

A. The number of single stuck-at faults (before collapsing).

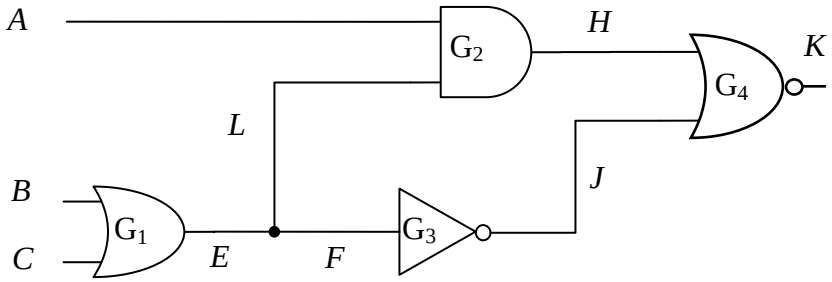
B. The number of equivalence collapsed faults (without fanout stem analysis).

C. The number of single bridging faults (two leads at a time).

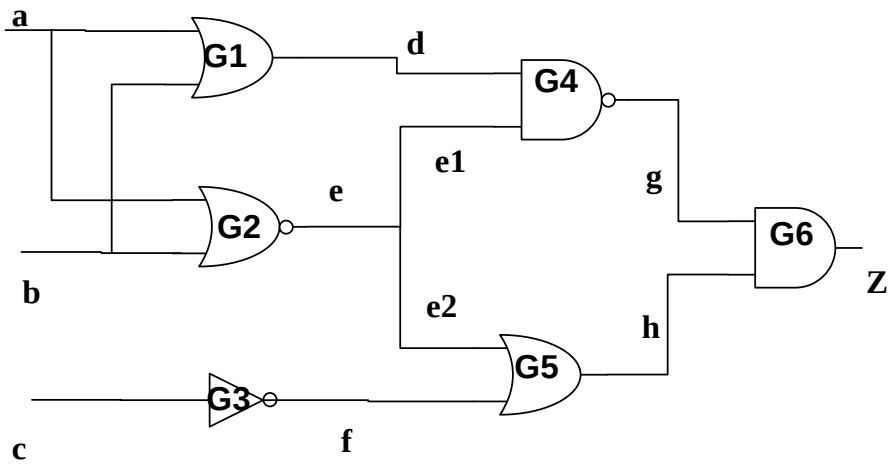


Problem 2: (12 points)

For the circuits shown below, please find the test cube for *A stuck-at one* fault using Boolean difference.



Problem 3. (20 points)

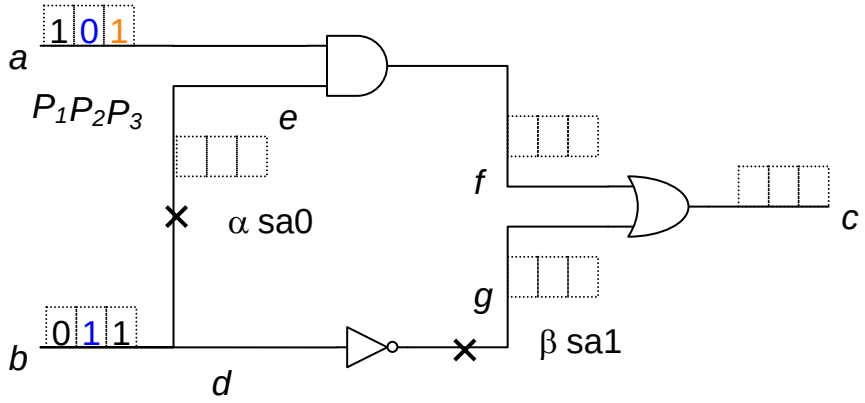


Please use the PODEM algorithm to generate a test pattern for the *e* stuck-at 1 fault.

Please use the following table.

a	b	c	d	e	e1	e2	f	g	h	Z	comments

Problem 4. Fault Simulation (30 points)



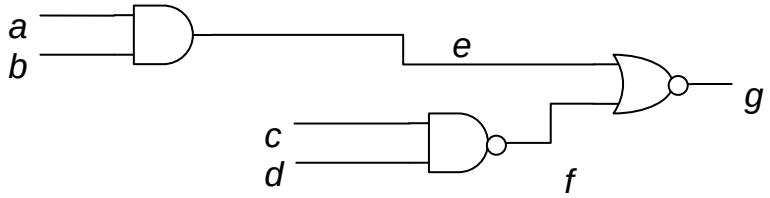
A. Consider all faults in the circuit. Please do a deductive fault simulation on the three test patterns applied. Please do fault dropping. What faults are detected in which patterns?

B. Consider only two faults α,β. Please do a parallel fault simulation on this circuit. Please fill in the blanks in the figure. Which fault is detected by which pattern? Assume the CPU word size W=3.

C. Consider only two faults α,β. Please do a parallel pattern single fault propagation (PPSFP) simulation on this circuit. Please fill in the blanks in the figure. Which fault is detected by which pattern? Assume the CPU word size W=3.

Problem 5. Diagnosis (20 points)

For this circuit,



A. If we apply the following 4 patterns to this circuit, please fill in the blanks in the following table.

pattern #	a	B	c	d	e	f	g
1	1	0	1	0			
2	1	1	1	1			
3	1	0	1	1			
4	0	1	1	1			

B. If we test this circuit on the tester and the circuit fails the fourth test pattern. Use the dynamic cause-effect diagnosis technique we taught in class to diagnose this failure. What is the diagnosed fault? Show all of your results, including the partial fault dictionary.