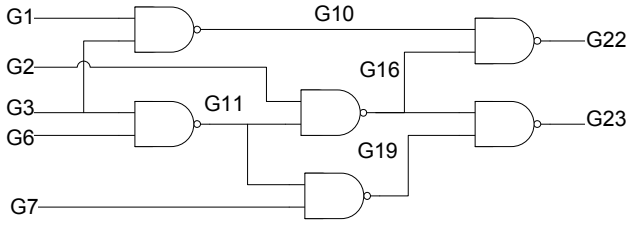
The S17 circuit



Faults according to the Stuck-at Fault model:

F1: SA0 on G10
F2: SA1 on G10
F3: SA0 on G11
F4: SA1 on G11
F5: SA0 on G16
F6: SA1 on G16
F7: SA0 on G19
F8: SA1 on G19

Optional assignment:

If you opt for this assignment, don't turn the page until you are done.
Generate test patterns for these faults (by hand).
After compaction, four test patterns is reasonable.

	Test set					
	G1	G2	G3	G6	G7	
TP1	0	1	1	1	0	F1(G22), F4(G22,G23), F5(G22,G23), F7(G23)
TP2	1	0	1	0	1	F2(G22), F3(G23), F8(G23)
TP3	0	1	1	0	0	F3(G22,G23), F6(G22,G23)

Optional assignment:

If you opt for this assignment, don't turn the page until you are done.

Construct a fault dictionary for the faults on the previous page and the test patterns from this page.

Fault dictionary

	F1	F2	F3	F4	F5	F6	F7	F8	
TP1	1	0	0	3	3	0	2	0	(*)
TP2	0	1	2	0	0	0	0	2	
TP3	0	0	3	0	0	3	0	0	

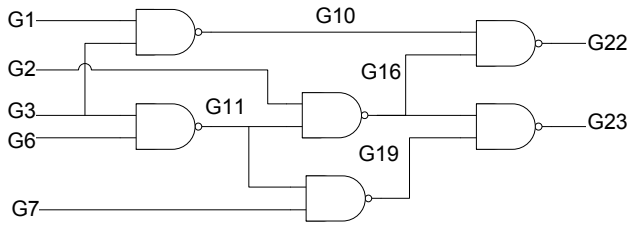
0: No fault on any output
1: Fault on output G22
2: Fault on output G23
3: Fault on both G22 and G23

(*) The test set cannot differentiate between fault F4 and fault F5.

Assignment:

Generate a test pattern to complement the test set from the previous page (TP1 to TP3), such that the test set can differentiate between the faults F4 and F5.

The S17 circuit



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F5: SA0 on G16
F6: SA1 on G16
F7: SA0 on G19
F8: SA1 on G19

Assignment:

Using a single fault-assumption, categorize the faults according to the the different combinations of faulty/non-faulty signatures that can be read on the primary outputs.

When you are done, compare with your fault dictionary.

Also compare your result with the location of the faults. How effective is analysis of the faulty/non-faulty signature on the outputs in localising the fault in this example?

G22	G23	
V	V	No faults
V	X	?
X	V	?
X	X	?