

Figure 2: Parallel fault simulation

4. (Bushnell and Agrawal) Problem 7.13

5. (Bushnell and Agrawal) Problem 7.8

Note : While you are performing the PODEM algorithm, follow the rules given below.

- Order: Try to excite the fault first then propagate.
- Backtrace: Follow a path from the objective to a primary input while always following the alphabetical order (e.g. if a gate has input A and B, backtrace on that gate goes to line A first).
- PI assignment: Always assign 0 first, then assign 1 in case of backtrack.
- Choice of D or D_bar : Always try to propagate a D or D_bar from the D-frontier which has the shortest path to the primary output.
In the case of tie, follow the alphabetical order.

6. A PODEM like test generator is used to generate a test for the line v s-a-1 in the circuit shown in Figure 3 .

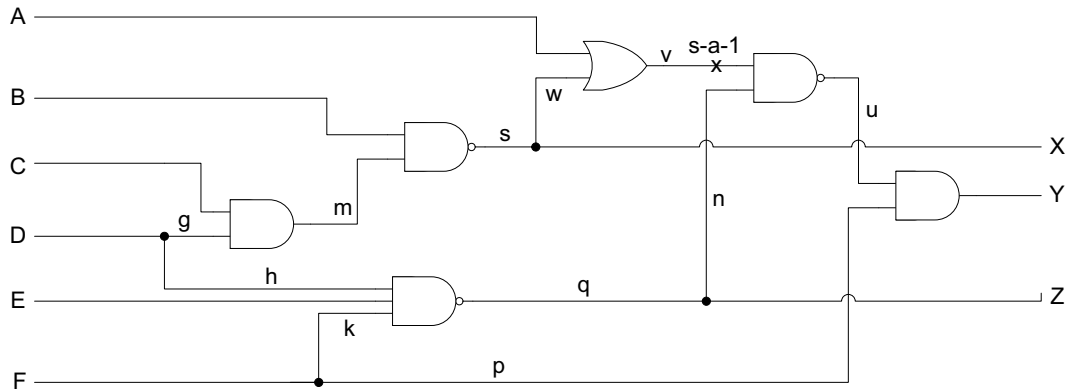


Figure 3: Circuit for Problem 6

- (a) Complete the table for the test generation process. Follow the rules given below (the first and second entries are given to you, and filling the entire table may not be necessary):
- For this problem, assume that the order of primary input assignments is D, C, B, A, F, then E.
 - While backtracing, using the easy/hard heuristic.
 - While assigning a value at an input, always assign a 1 before a 0.
 - Do not perform x-path check.
- (b) Construct the decision tree.
- (c) Write the generated test. A B C D E F =

Step	Objective	Backtrace path	PI assign	D-front	comment
1	$v=0$	v-w-s-m-g-D	D=1		Objective not satisfied
2	$v=0$	v-w-s-m-C	C=1		Objective not satisfied
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

7. (Bushnell and Agrawal) Problem 6.8

8. You are required to work with the circuit n432 and 10 test vectors.

The circuit n432 can be found here:

`/pong/usr0/e/ece553/TESTCAD/nets/hw3-circuits/n432`

The 10 Test Vectors can be found here:

`/pong/usr0/e/ece553/TESTCAD/nets/hw3-circuits/n432.10vec`

Use the testcad tools to answer the following questions.

- a) Apply the given 10 test vectors to n432 and determine the fault coverage. (submit coverage information)
- b) Use PODEM to generate tests for each fault (without intervening fault simulation). Indicate how many tests are generated and which faults are found to be untestable or aborted.
- c) Choose any 10 test vectors from your list of test vectors, then fill in the X's using 'randvec'. Determine the fault coverage of your 10 vectors and compare that with the coverage of 10 vectors obtained in part (a). submit your 10 vectors and the coverage of your vector set.

Note: In all the problems in this homework, if you are asked to compute fault coverage, use the fault list reduced by structural fault equivalence unless mentioned otherwise.