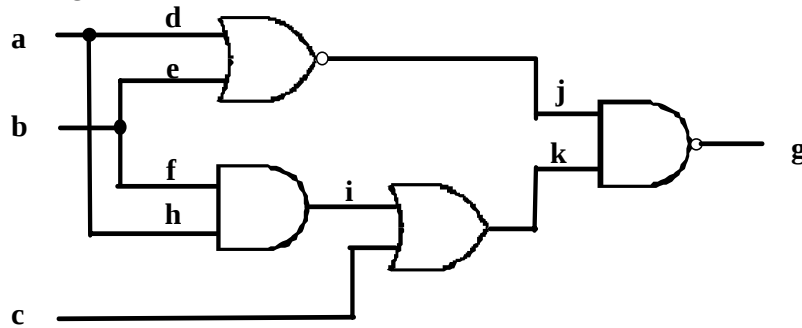


The University of Alabama in Huntsville
ECE Department
CPE 628 01
Test 1
October 2, 2008

Name: _____

1. (10 points) For the circuit shown, calculate the probability-based observabilities given the controllabilities given.



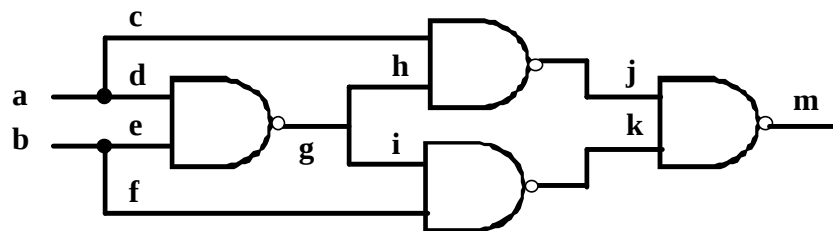
Line 0-C/1-C/O

a	0.5/0.5/_____	f	0.5/0.5/_____
b	0.5/0.5/_____	h	0.5/0.5/_____
c	0.5/0.5/_____	i	0.125/0.5/_____
d	0.5/0.5/_____	j	0.5/0.25/_____
e	0.5/0.5/_____	k	0.25/0.5/_____
		g	0.125/0.5/_____

2. (5 points) The number of failures in 10^9 hours is a unit (abbreviated FITS) that is often used in reliability calculations. Calculate the MTBF for a system with 10 components where each component has a failure rate of 3000 FITS.

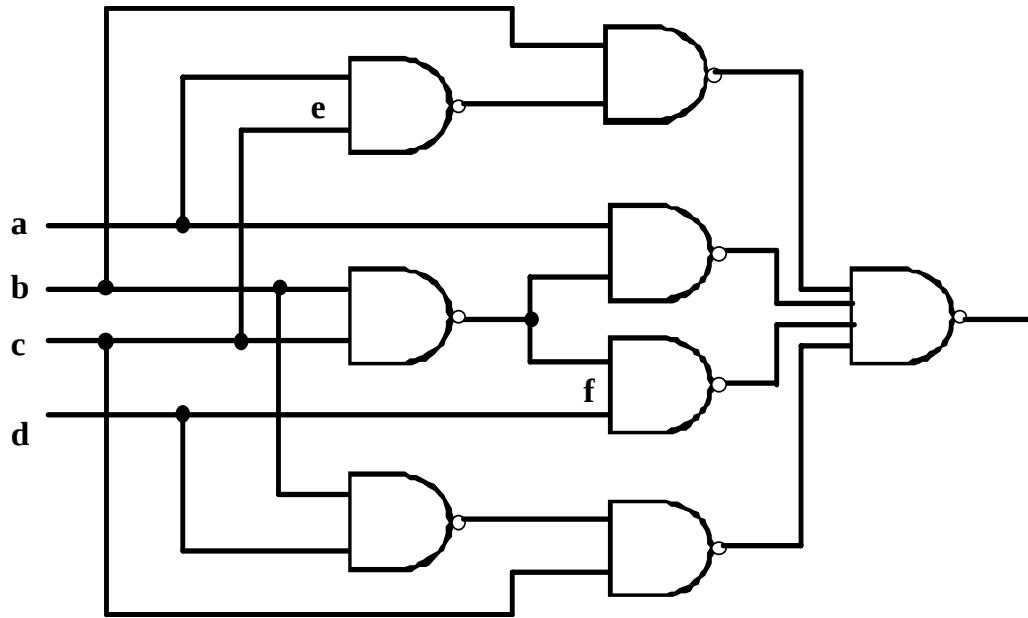
3. (10 points) Generate a minimum set of test vectors to completely test an n-input XOR gate under the single stuck-at fault model. How many test vectors are needed?

4. (15 points) For the circuit given, calculate the SCOAP controllability measures.



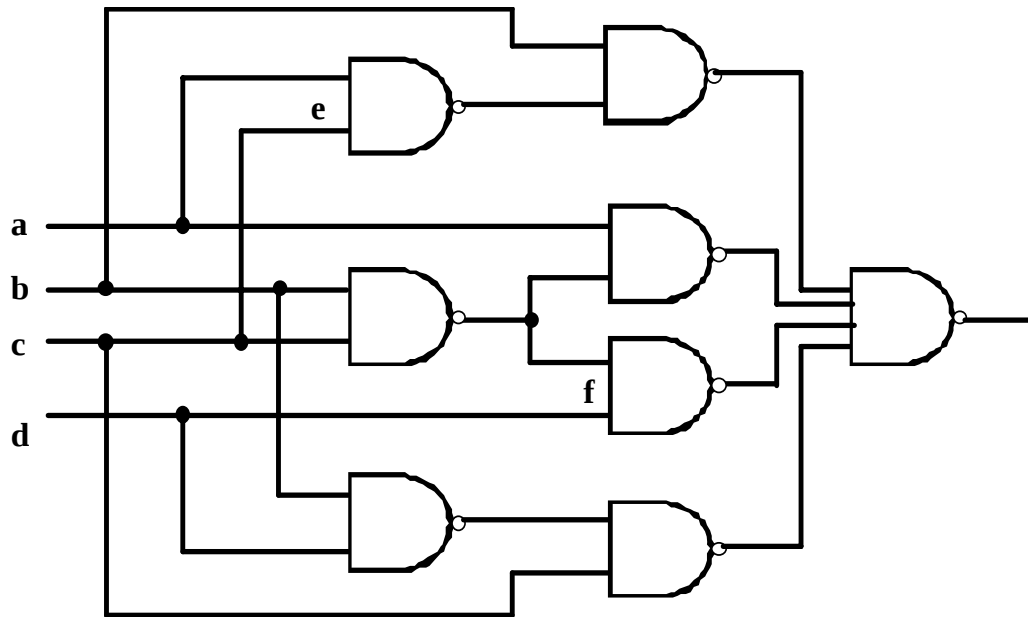
5. (1 point) The symbol _____ represents the logic value unknown.

6. (10 points) For the circuit shown and the two faults $e/0$, $f/1$, use the parallel-pattern single-fault propagation technique to identify which faults can be detected by the test patterns $(a, b, c, d) = (0, 1, 0, 1), (1, 1, 0, 1)$.



7. (1 point) A _____ is a flaw or physical imperfection that may lead to a fault.
8. (1 point) The goal of _____ is to find an efficient set of test vectors that detects all faults considered for a circuit.

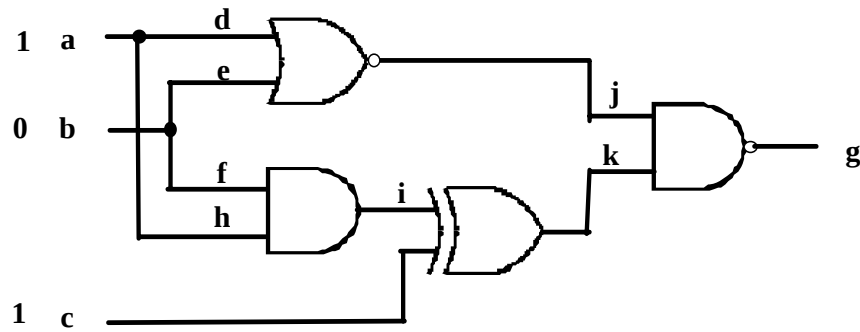
9. (10 points) Use the circuit, faults and patterns of problem x to do parallel fault simulation.



10. (1 point) The most widely used structured DFT methodology is _____.

11. (1 point) _____ helps the designer verify that a design conforms to the functional specifications.

12. (15 points) For the circuit shown, use deductive fault simulation to determine the faults detected by the pattern shown.



13. (15 points) For the circuit shown, use concurrent fault simulation to determine whether the faults $g/0$, $c/0$, $k/0$ are detectable for the pattern given.

