EGE534 HW #3 *Dr. Izadi*

Name: _____

Problem 1 (20 Points)
Read the following papers and write a summary (maximum length: one page double spaced) for each paper.

- W. Bartlett, L. Spainhower, "Commercial Fault Tolerance: A Tale of Two Systems," IEEE Transactions on Dependable and Secure Computing, Vol. 1, No. 1, pp. 87-96, January -March 2004, (PDF)

- D.P. Siewiorek, R. Chillarege, and Z.T. Kalbarczyk, "Reflections on Industry Trends and Experimental Research in Dependability," IEEE Transactions on Dependable and Secure Computing, Vol. 1, No. 2, pp.109-127, April - June 2004. (PDFT)

Problem 2 (20 Points)
Using the combinatorial model, determine the reliability of a simplex, TMR, and 5MR systems as a function of reliability of a simplex system, R(t) . You may assume a fault-free voter. Using MathLab, plot the reliability of the three systems versus R(t) and comment on their relative reliabilities.

Problem 3 (25 Points)
Using Markov model, determine the discrete solution for the reliability of a 3MR system with λ failure rate and μ repair rate. You may assume that the system initially is fault free. Using MathLab plot R(t) from 0 to 5 hours using

a. $\Delta t = 0.01$, $\lambda = .0001$ and $\mu. = .01$
b. $\Delta t = 0.01$, $\lambda = .001$ and $\mu. = .01$
c. $\Delta t = 0.01$, $\lambda = .0001$ and $\mu. = .001$

Problem 4 (20 Points)

a. Mark all single stuck faults on Figure 1, taking one fault from each equivalence class.
b. Use the Boolean difference to determine all possible tests for the fault “primary input B stuck-at-1” in Figure 1.

Problem 5 (20 Points)

a. Use the D-algorithm to obtain a test pattern T that detects the fault "line α stack-at-0" in the logic circuit of Figure 1.
b. Identify at least three other stuck at faults that are detected by the same test T.

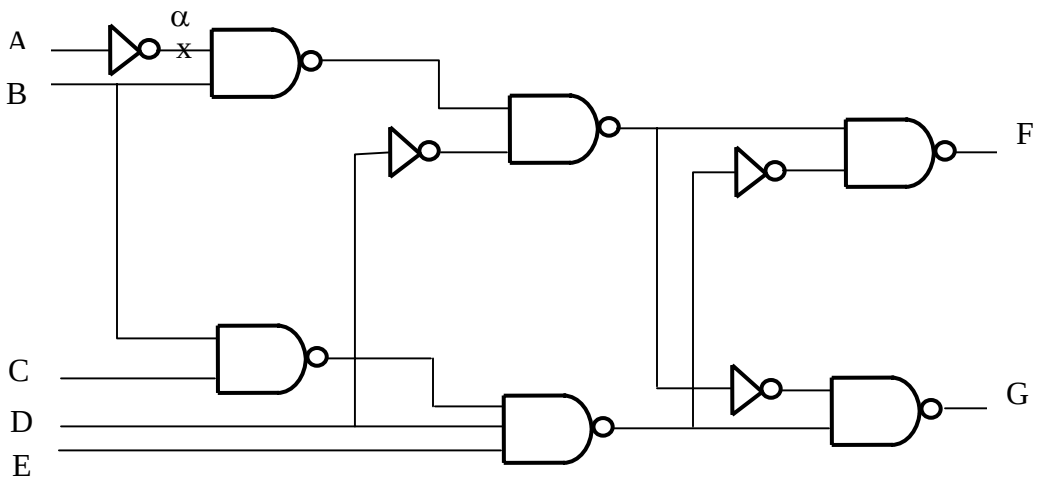

Figure 1

Due: Wednesday June 20, 2007