ECE 753 - FAULT-TOLERANT COMPUTING  
(Spring 2013-14)  
PROBLEM SET 3  

Date: February 27, 2014 Thursday  
Due Date: March 6, 2014 Thursday

Please write your answers legibly, be brief, and to the point. Preferably submit a printed copy of your solution. Some of the problems may be same or similar to the past offering of the course and I strongly urge you to do the problems yourself instead of relying on some solution that may be available from past offering. Some of the problems will be graded for submission credit only, but you must do all problems assuming that they will be graded for completeness and correctness.

1. (10 points) Probability of failure and lifetime
   Problem 1 on page 48 of the text.

2. (15 points) Solving a Series parallel system
   Problem 4 on page 49 of the text.

3. (15 points) A parallel system (a somewhat challenging problem)
   Problem 11 on page 50 of the text. Use either induction or direct method.

4. (15 points) Solving a non series parallel system
   Problem 14 on page 50 of the text.

5. (15 points) Combinatorial method
   (a) Figure 2.7 on page 22 of the text compares 3MR and 5MR systems with a simplex system. Give a qualitative reason as to why at some stages 3MR and 5MR systems have lower reliability than the simplex system.
   (b) Draw a plot showing the reliability of a simplex and a triplex system for $\lambda = 1$ as a function of time. You can use any program (tool), such as Matlab, you wish to draw the plot.

6. (15 points) Solving Markov model
   Problem 16 on page 52 of the text.

7. (15 points) Constructing a Markov Model
   Problem 18(a) on page 52 of the text.