

## 22.38 PROBABILITY AND ITS APPLICATIONS TO RELIABILITY, QUALITY CONTROL AND RISK ASSESSMENT

Fall 2005

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### PROBLEM SET #1

Due Sept. 20, 2005

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1. In class on September 8 we began development of a master logic diagram for the top event hurricane-induced death by drowning in New Orleans. In doing this we mainly focused upon flooding affecting persons who did not evacuate before arrival of a hurricane. Please complete this exercise in the form of an event tree. Identify any important factors omitted from your analysis. What are the minimal cut sets of the top event?
2. Obtain an expression for  $\overline{(A + B + C)}$  in terms of  $\bar{A}$ ,  $\bar{B}$  and  $\bar{C}$ ; where A, B and C are binary events.
3. For the pumping system example from class, what are the minimal cut sets? If the support systems providing electricity, control and cooling were made redundant and separated, how might dependencies remain affecting their respective failures?