

Some Optimization problems for Reliability Analysis

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In a reliability analysis, it is important to consider that each component may contribute differently to the overall performance of the system, rather than if all components have equal importance. Real-life engineering systems require more sophisticated approaches to the analysis of reliability problems. An n -component system is said to have a k -out-of- n structure if it operates as long as at least k of the n components operate. These systems have been used to model engineering systems such as the microwave stations of a telecommunications network, oil pipeline systems and vacuum systems in an electron accelerator. In this study reliability analysis of a weighted- k -out-of- n :G system with several types of components are presented. The system is assumed to have n components, which are classified into m ($2 \leq m \leq n$) groups with respect to their weight and reliability, and it is assumed to operate when the total weight of all working components exceeds a predetermined threshold k . Moreover, some optimization problems in that context are also discussed and numerical examples are given.

Keywords. Optimization Problems, Reliability, Weighted- k -Out-Of- n Systems

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