

The number of failed components in a coherent working system when the lifetimes are discretely distributed

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Abstract

We study the number of failed components of a coherent system. We consider the case when the component lifetimes are discrete random variables that may be dependent and non-identically distributed. Firstly, we compute the probability that there are exactly $i = 0, \dots, n-k$, failures in a k -out-of- n system under the condition that it is operating at time t . Next, we extend this result to other coherent systems. In addition, we show that, in the most popular model of independent and identically distributed component lifetimes, the obtained probability corresponds to the respective one derived in the continuous case and existing in the literature. All details can be found in [1].

Keywords

Coherent system, K -out-of- n system, Discrete lifetime distribution, Reliability, Order statistics.

References

- [1] Jasiński, K. (2021). The number of failed components in a coherent working system when the lifetimes are discretely distributed. *Metrika* 1–14. DOI:10.1007/s00184-021-00817-2