Preservation of IFR property for systems with two or three minimal paths of the same length

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Abstract

In this work we study increasing failure rate property (IFR property) preservation appearing in reliability theory. That means that if components have this aging property, then the system inherits it. We investigate whether coherent systems with the same length of minimal paths preserve IFR property. Such studies support both the design of new systems and the maintenance of existing ones. They contribute to the development of reliable systems while helping to keep implementation and operating costs reasonable.

We prove that coherent systems with two or three minimal paths of the same length indeed inherit mentioned property. Proves of this statement were not trivial. Our approach needed more precise description of such systems, which can by seen in this work.

These developments extend existing results on the topic of aging properties preservation under the construction of systems and is another approach on proving hypothesis that all systems with the same length of minimal paths preserve IFR property, which was presented in [3].

Keywords

Reliability theory, Coherent systems, Aging classes, IFR property.

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