

## عنوان مقاله:

Cost Benefit Analysis of a k-out-of-n: G Type Warm Standby Series System Under Catastrophic Failure Using Copula Linguistics

## محل انتشار:

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## خلاصه مقاله:

This paper deals with the study of reliability measures of a complex engineering system consisting three subsystems namely L, M, and N in series configuration. The subsystem-L has three units working under ۱-out-of-۳: G; policy, the subsystem-M has two units working under ۱-out-of-۲: G policy and the subsystem-N has one unit working under ۱-out-of-۱: G; policy. Moreover, the system may face catastrophic failure at any time  $t$ . The failure rates of units of all subsystems are constant and assumed to follow the exponential distribution however, their repair supports two types of distribution namely general distribution and Gumbel-Hougaard family copula distribution. The system is analyzed by using the supplementary variable technique, Laplace transformation and Gumbel-Hougaard family of copula to derive the differential equations and to obtain important reliability characteristics such as availability of the system, reliability of the system, MTTF, and profit analysis. The numerical results for reliability, availability, MTTF, and profit function are obtained by taking particular values of various parameters and repair cost using maple. Tables and figures demonstrate the computed results and conclude that copula repair is more effective repair policy for better performance of repairable systems. It gives a new aspect to scientific community to adopt multi-dimension repair in form of copula. Furthermore, the results of the model are beneficial for system engineers and designers, reliability and maintenance managers.

## کلمات کلیدی:

k-out-of-n: G system, Availability, MTTF, Catastrophic failure, Gumbel-Hougaard family copula distribution

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