Two-Dimensional Weighted *K*-out-of-*n* System and its Dynamic Reliability Measures

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ABSTRACT

The multi-state two-dimensional system is paramount in reliability theory, showcasing its versatility across various engineering systems. Its application extends to modelling complex scenarios where components can exist in multiple states, allowing a more nuanced analysis of system reliability and performance. In the prior studies, the predominant methodology was to consider all elements within the multi-state two-dimensional system as binary and that too in a steady state. Despite the prevalence of intricate systems, the components within this type of system can exhibit multi-state and dynamic characteristics i.e., their states change over time. To deal with this circumstance, the current work presents an algorithm, based on the L_z-transform to determine the reliability measures of the considered system in the dynamic setup. The Markov process is assumed to be followed by the components of the considered system and is mended only after when they are entirely failed.

Keywords: L_z-transform, UGF method, Two-dimensional System

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