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TIME TO REPLACEMENT OF A SYSTEM WITH PERMISSIVE AND OBLIGATORY THRESHOLDS

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Abstract: Shock exerts on the system is a common phenomenon in reliability theory. These shocks will create damage to the system due to its impact. The system receives shocks in two mutually exclusive ways, internally (circuit problem, a heavy supply of voltage, etc.) and externally (shocks by the circumstances). Adequate replacement of the system due to the damages is not realistic since it involves cost. A stochastic model is constructed with three different cases of shocks and the time to replacement of a system is obtained, when the cumulative damages cross its obligatory threshold. The numerical illustration has been made to the mean and variance of time to replacement and the realistic conclusion is presented.

Keywords and Phrases: Time to replacement, cumulative damages, permissive threshold, obligatory threshold, shock model approach.

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1. Introduction

A shocks creating damages to the system placed in the environment is a common phenomenal in reliability theory. The system receives shocks in many different categories and it is classified into two mutual exclusive shocks (i) Internal power supply or voltage problem. (ii) Shocks due to circumstances. These shocks will create damage to the system due to its impact. The time at which the cumulative damages crosses the obligatory threshold, cannot be predicted. Defining a