A Queueing System Equipped with two Components Subject to Random Failures and Heterogeneous General Service with Fluctuating Rates Depending on State of the Components

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Abstract

We study a batch arrival queueing system with a single server equipped with two components $C_1$ and $C_2$ both subject to random failures with different failure rates. There are two repair facilities, one each for the two components. The system works in full efficiency as long as both components are in working state. However, the system works in reduced efficiency if $C_2$ is in the failed state, it works in low efficiency if $C_1$ is in the failed state and the system is completely down if both $C_1$ and $C_2$ are in the failed state. The system provides service to customers with different general service times with different service rates depending on the fluctuations in the system efficiency. Steady state probability generating functions are obtained for various states of the system and results for some particular cases have been derived.