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Unreliable $M^X/(G_1, G_2)/1$ Retrial Queue with Bernoulli Feedback Under Modified Vacation Policy

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Abstract

In this paper, a batch arrival retrial queueing system with Bernoulli feedback and balking under modified vacation policy is considered wherein the server provides two phases of essential service to all arriving customers. In addition, the server may breakdown during the busy state at any time. After the completion of two phases of heterogeneous service, the server may go for `j^{th}' ($1 \leq j \leq J$) vacation on finding the orbit empty until at least one customer is accumulated in the system. The inter-retrial times, service times, repair times and vacation times are assumed to be governed by the general distribution. By introducing the supplementary variables and using generating function, the expressions for the expected number of the customers in the orbit as well as in the system are derived. Finally, the numerical results are provided.

Keywords: Retrial queue, bulk arrival, balking, modified vacation, unreliable server.