International Journal of Information and Management Sciences
Volume 23, Number 4, pp. 409-424, 2012

Transient Solution of a Non-empty M/M/1 Queue Subject to Catastrophes, Server Failures and Repairs

M. C. Saravanarajan and V. M. Chandrasekaran
VIT University

Abstract

In this paper, we illustrate how generating function technique can be used to obtain the transient solution of a nonempty M/M/1 queueing system subject to catastrophes, server failures and repairs. The steady state probabilities of the system size and certain performance measures are deduced. Busy period analysis has been carried out using continued fraction methodology. We also present reliability and availability analysis of the model. Numerical illustrations are provided to see the effect of parameters on system performance measures.

Keywords: M/M/1 queue, catastrophes, transient analysis, steady state analysis, busy period analysis.