

A Retrieval Inventory System with Non-Preemptive
Priority Service

K. Jeganathan, N. Anbazhagan and J. Kathiresan
Alagappa University

Abstract

We consider a queueing-inventory system with two types of customers, say, high priority and low priority, arrive according to Poisson processes. The service times are exponentially distributed. The inventory is replenished according to an (s, S) policy and the replenishing times are assumed to be exponentially distributed. Retrieval is introduced for low priority customers only. The orbiting customers compete for service by sending out signals that are exponentially distributed. The joint probability distribution of the number of customers in the waiting area, the number of customers in the orbit and the inventory level is obtained for the steady state case. Some important system performance measures in the steady state are derived. Several numerical examples are presented to illustrate the effect of the system parameters and costs on these measures.

Keywords: (s, S) policy, continuous review, inventory with service time, retrieval, markov process, priority customers.