Abstract

This paper studies two stochastic Models (A) and (B) with bulk production and bulk sales of products with catastrophe. The system has infinite storing capacity and the production and sales sizes are finite valued random variables with finite maximum production and sales sizes. When a catastrophe occurs the entire stocks are sold. Matrix partitioning method is used to study the models. In Model (A) the maximum production size is greater than the maximum sales size and the infinitesimal generator is partitioned as blocks of the maximum production size for analysis and in Model (B) the maximum production size is less than the maximum sales size and the latter is for partition. The stationary stock level probabilities, its expected values, its variances and probabilities of empty level are derived for the two models using the rate matrix iterated. Numerical examples are presented for illustration. Bulk arrival and bulk service queue becomes a special case of the model considered.

References

- Noam Paz, and Uri Yechali, 2014 An M/M/1 queue in random environment with disaster, Asia- Pasific Journal of Operational Research 01/2014;31(30. DOI: 101142/S021759591450016X

Index Terms

Computer Science
Information Sciences

Keywords
Block Sizes  Stationary Probability  Infinitesimal Generator and Matrix Geometric Approach.