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SOME EXISTENCE THEOREMS OF OPTIMAL INVENTORY EQUATION

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Abstract

This paper presents a method for the existence of solution of a renewal equation in inventory problem. We have proved several theorems in this connection using contraction principle. The salient feature of the model is the introduction of a discount factor to prevent infinite costs from entering, so as to suit some real situations. It has been assumed that orders are made at equal interval of time at different stages and excess demand leading to a penalty cost. Here we have considered the case of unbounded time period and discounted cost . We have considered that the functions are independent of time. We have set two lemmas to prove the existence theorems. In this paper we have taken the state space, constituting the state variable and the decision space constituting the decision variable. In this article we have determined the policy, which will minimize the expected total cost. The existence of the unique solution for the optimal inventory equation has been given in the light of fixed point theorem.

Key Words : *Initial ordering, Penalty cost, State variables, Unbounded period, Discount ratio, Complete metric space, Contraction principle.*

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