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OPTIMIZATION OF IMPERFECT QUALITY ITEMS WITH MULTIPLE SCREENING AND SHORTAGE BACKORDERING INVENTORY MODEL

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Abstract

The paper considers an inventory integrated model where items are inspected through multiple screening processes before delivery to customers. Each screening process has independent screening rate and defective percentage. Defective items screened out are stored and then returned to supplier. Shortage backordering are also allowed in the model. Two approaches are used to obtain the closed form optimal order size and the maximum backordering quantity. These models have been developed using different optimization methods. A full fuzzy model is developed where the input parameters and the decision variables are fuzzified. The optimal policy for the developed model is determined using the Lagrangean conditions after the defuzzification of the cost function with the graded mean integration method. The proposed method finds the optimal order size in both fuzzy and crisp situation. Numerical examples are provided to highlight the difference between crisp and the fuzzy cases.

Key Words : Fuzzy inventory, Backordering, Screening, Function principle, Graded mean integration representation, Integrated inventory model, The total inventory cost.

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