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Chapter 4

Inventory Modelling of Deteriorating Item and Preservation Technology with Advance Payment Scheme Under Quadratic Demand



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Abstract This chapter comprises a single retailer and single product which deteriorates continuously. For the time-dependent deteriorating item with seasonal demand, quadratic demand is debated here which is suitable for the items whose demand with starting of the season increases initially and after end of the season, it starts to decrease. To reduce deterioration of the product, retailer needs preservation technology and due to preservation technology retailer minimizes total cost. In this chapter, the retailer has to pay a fraction of the purchase cost before the time of delivery and rest of the payment must be paid at the time of delivery. In this chapter, the optimal number of equal instalments before receiving the order quantity, replenishment time and investment of preservation technology are the decision variables that minimize the total cost. This chapter is an extension of the earlier work, as it provides the best optimal rather than the nearest minimum solution. A numerical example is delivered to demonstrate the performance of the model and to highlight certain decision-making insights.

Keywords Quadratic demand · Maximum lifetime deterioration · Preservation technology · Equal number of instalment of advance payment

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