Abstract

The thesis is constructed by eight chapters.

In Chapter 1, an introduction of inventory management is given. This chapter consists of some major findings regarding inventory with literature review. Finally, this chapter ends with the highlights of present research works.

Chapter 2 presents an ordering and transferring model along with random deterioration for distinct demand patterns. A multi-delivery system is utilized in this chapter for transporting items.

Chapter 3 explained a deteriorating inventory model, where demand of products is considered as selling-price and time-dependent. Permissible delay-in-payments is assumed to the retailer by the supplier. This chapter provides various price-discount policies for retailer.

Chapter 4 depicts supplier's and retailer's trade-credit policy for fixed lifetime products. This chapter extends Mahata's (2012) model [Mahata, G.C. (2012). An EPQ-based inventory model for exponentially deteriorating items under retailer partial trade-credit policy in supply chain. *Expert Systems with Applications*, 39, 3537-3550.] by inserting time-varying deterioration.

Chapter 5 deals with the situation, where the supplier offers their retailer a full trade-credit policy, but the retailer gives a partial trade-credit system to consumers. For such assumption, retailer can achieve more benefit. This chapter contributes an idea about exponential deterioration.

In Chapter 6, there is a production system, which randomly transfers to *out-of-control* state from *in-control* state. Product inspection policy is considered to reduce inspection cost. Type I and Type II errors are included in this chapter. Warranty policy for some fixed time-periods is inserted in this chapter.

Chapter 7 considers the impact of carbon-emission cost reduction throughout the shipping products in industry sector. Vendor's setup cost is taken to be as variable and delivery lot sizes are considered as unequal. After receiving the lot, buyer performed an inspection process to detect defective items. Finally, those imperfect quality products are returned to vendor to rework.

Chapter 8 formulates an integrated-inventory model, where Stackelberg game policy is used to optimize the joint total cost of vendor and buyer. Two types of inspection costs for buyer and setup cost reduction for vendor are derived. This chapter also stated about carbon emission and transportation cost for vendor.