Abstract

In this paper, a realistic replenishment model with multiple warehouses (one is primary warehouse (PW) from where the items are sold and others are secondary warehouses (SWs) where the items are stored) is developed with fuzzy lead-time under the assumption that the capacities of the warehouses are finite. Inflation and time value of money are taken into account. The items of secondary warehouses are transported to the primary warehouse in continuous release pattern and associated transportation cost is proportional to the distance from PW to SWs. The holding cost of items in SWs has reverse effect with distance. Here, the demand of items is a deterministic function of selling price and the displayed inventory. Deterioration rates of the items are constant and different in different warehouses. The replenishment rate is infinite and the problem is constructed with shortages, which are the mixture of back orders and lost sales. The backlogged demand is assumed to be a function of currently backlogged amount. When an item is out of stock, the loyal and captive customers will wait until the outstanding orders arrive and are served. To compensate the inconvenience of backordering and to secure orders, the supplier may offer a price discount on the stock out item. There are three scenarios depending upon the time when the new order is placed for the next
cycle. The problem is illustrated with the help of numerical examples.

References

Index Terms

Computer Science
Information Sciences

Keywords

Inventory  Multi-warehouses  Deterioration  Fuzzy lead-time  Back order  Lost sale  Backorder discount  Inflation  Time value of money.