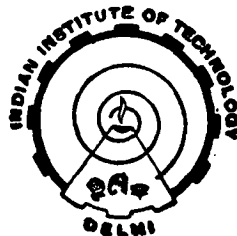


MODELLING OF INVENTORY SYSTEMS UNDER INFLATION, PERISHABILITY AND STOCK DEPENDENT CONSUMPTION

by
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*A THESIS SUBMITTED
IN FULFILMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE DEGREE OF*

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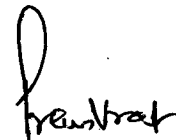
**Department of Mechanical Engineering
INDIAN INSTITUTE OF TECHNOLOGY, DELHI
AUGUST, 1989**

DEDICATED TO
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CERTIFICATE

This is to certify that the thesis entitled "MODELLING OF INVENTORY SYSTEMS UNDER INFLATION, PERISHABILITY AND STOCK DEPENDENT CONSUMPTION", being submitted by Mr. G. Padmanabhan to the Indian Institute of Technology, New Delhi, for the award of the degree of Doctor of Philosophy, in Mechanical Engineering is a record of bonafide research work carried out by him. He has worked under my guidance and supervision and has fulfilled the requirements for the submission of this thesis, which has attained the standard required for a Ph. D degree of the Institute.

The results contained in this thesis have not been submitted in part or in full elsewhere for the award of any degree or diploma.



(PREM VRAT)

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ABSTRACT

Over the last three decades the literature on inventory theory and its applications to real life inventory systems has experienced a phenomenal growth as a result of increasing computers usage in inventory management and the realization of its importance on the economic performance of an organisation.

In this thesis, a number of models are developed for items with stock dependent consumption rate considering the phenomena such as perishability, inflation, varying unit cost, quantity discounts etc. Inventory models are also developed to determine the special order size when amount of price increase effective from a future date is known. Integrated inventory models are also developed considering both perishability and inflation simultaneously for different demand patterns. Effect of stock dependent consumption rate, perishability, and inflation parameters on ordering quantity and total system cost are analysed. Incorporating partial backlogging aspect, inventory models are developed both for perishable and non-perishable items. Effect of backlogging parameter on ordering quantity, maximum inventory level and total system cost is also

examined. Sensitivity analysis of the models developed is carried out. Inventory models with stock dependent selling rate are also developed incorporating perishability and partial backlogging.

Also an attempt is made to utilize the goal programming for multi-item inventory problems under resource constraints to determine the optimum ordering quantities with multiple objectives.

At the end, the summary of major findings, the significant contributions made by the study, limitations of the present study have been discussed along with suggestions for future work. An extensive list of references is given at the end of the thesis.

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