Inventory management has to ensure that adequate stocks of raw materials, stores and finished goods are maintained. A lower inventory of raw materials or stores could result in stoppage of production. Similarly, lack of finished goods could result in loss of sales, loss of market due to substitution by competitors, products and loss of goodwill also. Inventory management also minimises the risk of obsolescence and loss due to slow moving or damaged goods.

The techniques of inventory management are primarily meant to optimise the inventories in relation to business conditions in which the particular unit operates. The techniques to be adopted would also depend not only upon the present business environment but also on the future expectations and, to this extent, business planning and forecasting are essential.

This research study deals with certain inventory models which are influenced by the market conditions and accordingly a profit maximisation approach is considered leading to the optimum decision making in subsequent situations.
The entire work is divided into NINE chapters. A summary of the same is presented below.

Chapter I describes some basic definitions and certain conceptual introduction of the subject under the study that is undertaken. This chapter thus lays down a foundation stone for the succeeding chapters to follow, and the entire framework has been indicated in this introductory presentation.

The study has been divided into two sections. First section deals with certain inventory models under the inflationary situations and the mark-up of prices. These models are developed in chapters II to V. Second section discusses the inventory models under study for production planning problems where an attempt is made to develop optimum resource allocation problems associated with the system. These models are discussed in chapters VI to IX.

Chapter II contains EOQ model pertaining to the units that are continuous in time. Profit maximisation approach with mark-up variation is described under the inflationary situations and the linear and hyperbolic quantity discount cases for the bulk purchase of the items. The derived model is suitably illustrated by means of its sensitivity analysis.
Chapter III discusses EOQ model for the units which are discrete in nature. The problem of profit maximisation is described under the influence of the inflationary situations with linear and hyperbolic quantity discount cases and the related costs. The developed models are illustrated by means of numerical examples and their detailed sensitivity analysis is also carried out.

Chapter IV considers the finite production rate inventory model for continuous units under inflationary situation and quantity discount cases. The models are illustrated by their sensitivity analysis.

Chapter V discusses Economic Lot Size inventory model subjected to the relevant costs and mark-up variation. The case of discrete units is considered here and its sensitivity analysis is carried out.

Chapter VI describes EOQ model considering profit maximisation approach for the units that are continuous in time. Here the problem is related to the production planning where the optimum use of labour and capital is determined under the given sets of conditions, mark-up variation and the relevant costs. The model is suitably represented by means of
numerical examples and its sensitivity analysis is also carried out to locate the sensitive parameters in the system.

In Chapter VII, EOQ model is considered for production planning problem when the units are discrete in nature. The optimisation of labour and capital inputs is to be determined subject to the given cost structure and with a view of maximising the net return. The impact of sensitivity parameters is highlighted by means of the sensitivity analysis.

Chapter VIII discusses the problem of Economic Lot Size model for determining the optimum use of the resources under the relevant costs and the mark-up variation.

Chapter IX contains the finite production rate inventory model for discrete units. The model is developed under the relevant cost structures and the mark-up variation with an objective of maximising the net return as well as the optimum resource mobilisation. The derived model is discussed by means of a numerical illustration and it is also tested for its sensitivity analysis.