PREFACE

The present thesis entitled "*A study of semi-Riemannian manifolds and its submanifolds*" is being submitted to the Faculty of Science, University of Lucknow, for the award of *Doctor of Philosophy* in Mathematics. It is an outcome of the research work carried out by me at the Department of Mathematics and Astronomy, University of Lucknow, Lucknow, India - 226007, under the able guidance and supervision of Prof. Rajendra Prasad.

This thesis consists eight chapters and each chapter is divided into several sections and subsections. The decimal notation has been used for numbering the equations. The bold decimal notation has been used for numbering the sections, subsections, theorems, lemmas, corollaries, propositions, definitions and examples. The numbers are written in the square bracket [,] refer to the references given at the end of all chapters.

In 1930, Schouten and Dantzig introduced the concept of a complex structure and Hermitian metric in differentiable manifold and called it complex manifold. In 1933 Kähler initially presented the idea of a Kählerian structure on a complex manifold. This opened an era of the complex manifold. Hermann Klaus Hugo Weyl $(1885-1955)$, pointed out in a complex manifold, there exists a $(1,1)$ tensor field J such that $J^2 = -I$, where I denote the unit tensor field, is called an almost complex structure. In 1950, Ehresmann defined an almost complex structure on an even dimensional manifold.

In 1958, Boothby and Wang initiated the study of an odd dimensional manifold. In 1959, Gray studied odd-dimensional manifold from the topological point of view and the structure introduced by them is called a contact structure. In 1960, Sasaki and in 1962, Hus made it possible to study the manifolds with the help of tensor analysis. These manifolds are called contact and almost contact manifolds.

In 1972, K. Kenmotsu studied a certain class of almost contact manifold. Janssen and Vanhecke named this structure as Kenmotsu structure and the