The present thesis is the result of various researches I have been carrying on since May 1991, under the esteemed guidance of Dr. H.K. Pathak, Head, Department of Mathematics, Kalyan Mahavidyalaya, Bhilai.

This thesis has been divided into two parts. Part I deals with Fixed point theorems whereas part II deals with applications of Fixed point theorems. In all there are twelve chapters. Chapter I is introductory which gives us a brief account of various definitions, some recent results of different workers and also a resume of the results obtained hitherto.

In chapter II compatible mappings of type (A-1) and type (A-2) has been introduced in metric spaces and some coincidence point theorems and common fixed point theorems have been proved for these mappings which improves many known results.

Chapter III deals with fixed point results in normed spaces whereas in chapter IV compatible mappings of type (A-1) and type (A-2) has been introduced in Fuzzy metric spaces and some fixed point results have been established for these mappings in Fuzzy metric spaces. Perhaps our result extends and generalises the Fuzzy version of Banach contraction principle obtained by Grabiec.

In chapter V the concept of coordinatewise compatibility of mappings in the contest of fixed point theory has been demonstrated while chapter VI is totally devoted to fixed point results in Menger spaces.

In chapter VII some fixed point theorems have been derived for mappings in locally convex Hausdorff Topological Vector spaces. Chapter VIII is fully devoted to fixed point results in 2-metric spaces whereas chapter IX deals with fixed point theorems in saks space.

In chapter X two fixed point theorems of Gregus type has been proved and these results have been applied to study the existence and uniqueness of certain discrete variational inequalities.
In chapter XI, the fixed point theorems established in chapter II, have been used to study the existence and uniqueness of certain functional equations arising in dynamic programming, whereas in Chapter XII a new class of complementarity problem called simultaneous complementarity problem have been introduced and the existence and uniqueness of its solutions have been studied by using the concepts of fixed point theory.

Finally a well arranged bibliography containing 211 references of research papers, monographs and other works, which have been referred to in this thesis has been given, and at the end I have attached reprints and Xerox copies of some of my published works.