PREFACE

The present work revolves around the Jungck's theorem (1976) which is essentially the most significant generalization of celebrated Banach contraction principle. In recent years Jungck's theorem has been extended and generalized in various ways and in various spaces such as uniform spaces, metric spaces and Banach spaces etc. By a fixed point theorem we shall understand a statement which asserts that under certain conditions (on the mapping $T$ and on the space $X$) a mapping $T$ of $X$ into itself admits one or more fixed points. Fixed point theory is an important area in the rapid growing fields of non-linear analysis. It has found extensive applications in various areas viz. the theory of non-linear oscillations, fluid flow, approximation theory, economic theories and initial and boundary value problems for ordinary and partial differential equations.

The present thesis comprises five chapters and each chapter consists of various sections which are numbered in the order in which they occur in the text. Each chapter begins with a brief introduction to its contents.

In Chapter-I, we have attempted to give a brief account of the historical development of the subject, preliminary concepts and the important results used throughout the thesis. This chapter is mainly aimed at making the present text as self contained as possible.

In Chapter - II, we have proved certain fixed point theorems in metric spaces employing the rational inequality as the contractive conditions. Our results generalize the earlier known results of Fisher, Maia and Edelstein etc. In the last Section we have attempted to prove some coincidence and fixed point theorems for expansion type mappings.
which generalize many earlier results of Taniguchi, Wang et. al. and Gillespie.

In Chapter - III, we have studied fixed point theorems in metrically convex metric spaces. Our main emphasis is to exploit the use of prevailing weak conditions of commutativity and thus we are able to obtain the results for a wider class of mappings. In the beginning we assume a pair of single-valued non-self mappings satisfying the Boyd and Wong type contractive condition. Our results are more general and extend an earlier result of Assad. In the next Section we have assumed a pair consisting of a single-valued and multivalued non-self mappings and obtain some results using weak commutativity conditions which seem more general and extend a result of Rhoades. In the last Section we have obtained some results for weakly commuting mapping which in turn, generalize many earlier known results due to Khan, Shimi and others.

Chapter - IV, is devoted to the study of fixed point theorems in 2-metric spaces. The fixed point theorems for multivalued mappings was first studied by Chang and Haung. Motivated from the weak commutativity and compatibility conditions of Hadzic and Gajić for a single-valued and multivalued mappings, we have introduced the analogous weak commutativity conditions for 2-metric spaces and obtain some fixed point results which perhaps seems to be new in the literature.

In the fifth and last Chapter we have obtained some fixed point results for hybrid contractions (viz. a pair of a single valued and multivalued mappings). The first Section give brief introduction to the work done in this direction. In the second Section we obtain some fixed point results for hybrid mappings using Hausdorff metric and employing
the weak commutativity and compatibility conditions introduced by Kaneko and Sessa. In their papers Kaneko and Sessa assumed the continuity of both the single-valued and multivalued mappings and raised the question that the continuity of both mappings is necessary or not for the existence of the fixed point. In the results we proved in this section we are able to show that the existence of the fixed point is guaranteed by assuming only the single-valued mapping as continuous and that the continuity of the multivalued mappings are not needed at all in the proof. The last Section is devoted to the study of fixed point theorems using diametral distances employing the contractive conditions of Som-Mukherjee. The mappings involved are assumed to satisfy the various weak commutativity conditions. In this way our results are more general and the earlier results of Khan, Pachpatte and others can be derived as special cases.

In the end, a Bibliography which can by no means be regarded as exhaustive, is given which contains only those books and papers which have been referred in this exposition.