Preface

Fixed point theory is one of the most powerful and fruitful tools of modern mathematics and may be considered a core subject of nonlinear analysis. In the last 50 years, fixed point theory has been a flourishing area of research for many mathematicians. The origins of the theory, which date to the later part of the nineteenth century, rest in the use of successive approximations to establish the existence and uniqueness of solutions, particularly to differential equations. This method is associated with many celebrated mathematicians like Cauchy, Fredholm, Liouville, Lipschitz, Peano, and Picard. It is worth noting that the abstract formulation of Banach is credited as the starting point to metric fixed point theory. But the theory did not gain enough impetus till Felix Browder's major contribution to the development of the nonlinear functional analysis as an active and vital branch of mathematics. In recent years a number of excellent books, monographs, and surveys by distinguished authors about fixed point theory have appeared. This monograph is an attempt to explore some of its aspects after the theory has reached a level of maturity appropriate to an examination of its central themes. One of the objectives of this monograph is to offer the mathematical community an accessible self-contained document which can be used as an introduction to the subject and its development. This monograph is composed of eight chapters on different aspects of the fixed point theory, namely, metric fixed point theory, Ekeland's variation principle, hyperconvex metric spaces, modular function spaces, discrete fixed point theory, topological fixed point theory, and iterative methods in fixed point theory.

Each chapter is written by different authors who attempted to render the major results understandable to a wide audience, including nonspecialists, and at the same time to provide a source for examples, references, open questions, and sometimes new approaches for those currently working in this area of mathematics. This monograph should be of interest to graduate students seeking a field of interest, to mathematicians interested in learning about the subject, and to specialists.

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Tabuk, Saudi Arabia   Saleh Almezel
Aligarh, India   Qamrul Hasan Ansari
El Paso, TX, USA   Mohamed Amine Khamsi

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