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FIXED POINT APPROXIMATION OF GENERALIZED NONEXPANSIVE MULTI-VALUED MAPPINGS IN BANACH SPACES VIA NEW ITERATIVE ALGORITHMS

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ABSTRACT. In this paper, we introduce a new iterative algorithm to approximate the fixed points of generalized nonexpansive multi-valued mappings in Banach spaces and utilize the same to establish weak as well as strong convergence theorems. Our results generalize and improve several previously known results of the existing literature.

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1. INTRODUCTION

The fixed point theory of multi-valued nonexpansive mappings is relatively more involved and cumbersome than the corresponding theory of single-valued nonexpansive mappings. Fixed point theory for multi-valued mappings has many fruitful applications in diverse fields, e.g. game theory, mathematical economics and several others. Therefore, it is natural to extend the known fixed point results for single-valued mappings to multi-valued mappings. However, some classical fixed point theorems for single-valued nonexpansive mappings have already been extended to multi-valued mappings. The earliest results in this direction were respectively established by Markin [10] in Hilbert spaces while by Browder [4] for spaces admitting weakly continuous duality mapping. Dozo [5] generalized these results in a Banach space satisfying Opial's condition. Though nonexpansive mappings are most extensively studied class of mappings in metric fixed point theory, yet there also exists considerable literature on the classes of mappings enlarging the class of nonexpansive mappings.

Throughout the paper, E stands for a real Banach space with the norm $\|\cdot\|$ and K a nonempty subset of E. Let $\mathbb{N}$ denotes the set of all positive integers. Let $CB(K)$, $C(K)$ and $P(K)$ denote the families of nonempty closed and bounded

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