APPROXIMATING COMMON SOLUTION OF VARIATIONAL INCLUSIONS AND GENERALIZED MIXED EQUILIBRIUM PROBLEMS

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Abstract In this paper, we introduce a new general iterative scheme for finding a common element of the set of solutions a common of generalized mixed equilibrium problems, the set of solutions of the variational inclusions with set-valued maximal monotone mapping and inverse-strongly monotone mapping, and the set of the fixed points of a family of finitely nonexpansive mappings in the setting of Hilbert spaces. We prove that the sequence converges strongly to a common element of the above three sets under some mild conditions. Our results improve and extend the corresponding results of Plubtieng and Sriprad (2009), Shehu (2010) and some authors.

Keywords. strong convergence; strictly pseudo-contraction; fixed point; variational inclusion; generalized mixed equilibrium problem; maximal monotone mapping, inverse-strongly monotone mapping

AMS (MOS) subject classification: 46C05, 47D03, 47H09, 47H10, 47H20.

1 Introduction

Throughout this paper, we assume that H is a real Hilbert space with inner product and norm are denoted by $\langle .,. \rangle$ and $\|.\|$, respectively. Let 2^H denotes the family of all subsets of H and C be a closed convex subset of H. Recall that a mapping $T : C \to C$ is said to be a *k-strict pseudo-contraction* [5] if there exists $0 \le k < 1$ such that

$$\|Tx - Ty\|^2 \le \|x - y\|^2 + k\|(I - T)x - (I - T)y\|^2, \forall x, y \in C,$$

where I denotes the identity operator on C. When $k = 0$, $T : C \to C$ is said to be *nonexpansive* [11] if

$$\|Tx - Ty\| \le \|x - y\|, \ \forall x, y \in C.$$

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