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A CLASS OF RANDOM STRONGLY NONLINEAR MULTI-VALUED VARIATIONAL INEQUALITIES [1]

Jong Kyu Kim[1,2], Heng-you Lan[3] and Young Man Nam[1,4]

[2]Department of Mathematics Education
Kyungnam University, Masan 631-701, Korea
[3]Department of Mathematics
Sichuan University of Science & Engineering
Zigong, Sichuan 643000, P. R. China
[4]Department of Mathematics Education
Kyungnam University, Masan 631-701, Korea

Abstract. In this paper, we introduce a new class of random strongly nonlinear variational inequalities with multi-valued mappings and prove some existence theorems of random solutions for this class in Hilbert spaces. We also construct some new random iterative algorithms and give the convergence of random Ishikawa and Mann iterative sequences generated by the algorithms. Several special cases, which can be obtained from our results, are also discussed.

Keywords. Random strongly nonlinear multi-valued variational inequality, random iterative algorithm.

AMS (MOS) subject classification: 49A29, 60H25, 55M20.

1 Introduction

It is well known that the study of the random equations involving the random operators in view of their need in dealing with probabilistic models in applied sciences is very important. Some related works, we refer to Bharucha-Reid [1] and Chang [2]. The random variational and random quasi-variational inequality problems have been introduced and studied by Chang [3], Chang-Huang [4], Chang-Zhu [5], Cho-Huang-Kang [6], Ganguly-Wadhwa [10], Huang-Cho [13], Huang-Long-Cho [15], Noor-Elsanousi [20] and Yuan [21].

On the other hand, Huang et al. [14] and Kim-Nam [16] introduced and studied some new Ishikawa and Mann iterative processes with errors for set-valued mappings in Banach spaces, and also prove some strong convergence theorems of the new Ishikawa and Mann iterative processes with errors for set-valued mappings by using the new approximation methods.

Recently, Choudhury [8] has suggested and analyzed random Mann iterative sequence in separable Hilbert spaces for finding random solutions and

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[2]Corresponding author: jongkyuk@kyngnam.ac.kr (Jong Kyu Kim).