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SYSTEM OF GENERALIZED RESOLVENT EQUATIONS INVOLVING XOR-OPERATION IN q-UNIFORMLY SMOOTH BANACH SPACES

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ABSTRACT. In this paper, we study a system of generalized resolvent equations involving XOR-operation in q-uniformly smooth Banach spaces. We have shown the equivalence of system of generalized resolvent equations involving XOR-operation with a system of generalized variational inclusions involving XOR-operation. Some iterative algorithms are proposed to approximate the solution for system of generalized resolvent equations involving XOR-operation.The convergence criteria is also discussed.

1. INTRODUCTION

It is worth to mention that variational inequalities and their generalizations are extended in various directions after their existence since early sixties. Variational inclusions are powerful tools to solve many problems of real life, for example, to solve problems related to mechanics, optimization and control, elasticity, basic and applied sciences etc., see for example [?,6,10,12,13,20,21,23] and references therein. System of variational inequalities are considered and studied by Pang [22], Cohen and Chaplais [8], Bianchi [7], etc..Pang have shown that the traffic equilibrium problem, the Nash equilibrium, and the general equilibrium programing problem can be modelled as a system of variational inequalities over product of sets. Agarwal et al. [2] studied the sensitivity analysis of solutions for a system of generalized nonlinear mixed quasi-variational inclusions, Pang and Zhu [24] studied a system of mixed quasi-variational inclusions with (H, η)-monotone operators and Lan et al. [14] studied a system of nonlinear A-monotone multivalued variational inclusions. Ahmad and Yao [1] studied a system of generalized resolvent equations with corresponding system of variational inclusions in real Banach spaces.

XOR is a binary operation, it stands for "exclusive or", that is to say the resulting bit evaluates to one if only exactly one of the bits is a set. This operation is commutative, associative and self-inverse. It is also same as addition modulo 2 in Boolean algebra. XOR(A,B) represents the logical exclusive disjunction and XOR(A,B) is true when either A or B are true.If both A and B are true or false, XOR(A,B) is false. As an application of XOR-terminology, we mention an example: Consider a light bulb to two 3-ways switches. The light goes on if only one switch is in the "up" position and the other switch is in the "down" position. If both are in the "up" position or both are in the "down" position, the light is off. The lights state (on,off) is the XOR of the state of the two switches. One can find its applications in many branchs of science, for example, to generate random pseudo numbers,

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