EXISTENCE, UNIQUENESS AND STABILITY RESULTS OF SEMILINEAR FUNCTIONAL SPECIAL RANDOM IMPULSIVE DIFFERENTIAL EQUATIONS

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Abstract. We deal with semilinear functional special random impulsive differential equations in this paper. Contraction mapping principle is used to study the existence and uniqueness of the mild solution of the system. Again we have established ulam stabilities, exponential stability and stability of the system, where the sufficient conditions for stability is established using continuous dependence on initial conditions. Also an example is included to verify the concepts and basic results in this paper.

Keywords. Existence, Uniqueness, Fixed point theorem, Random impulses, Stability.

AMS (MOS) subject classification: 35R12, 60H99, 34G20, 35B40.

1   Introduction

Random impulsive differential equations can be used as an essential tool to model many real life phenomena. This is why it has received attention of many researchers recently. There are plenty of literature on the topic of random impulsive differential equations. Large number of authors have considered Random impulsive differential equations [13–18]. Moreover, random impulsive differential equations have applications in many fields such as biology, economics and neural network.

Integro differential equations are applicable in many fields like chemistry, biology and fluid dynamics [1, 2, 7, 19]. Some existence results of impulsive