ABSTRACT

Impulsive differential equations arise naturally in the description of physical phenomena that are subjected to abrupt changes in their states at certain moments of time. The theory of impulsive differential equations has become an active area of investigation due to its applications in the fields such as mechanics, electrical engineering, biotechnology, medicine and so on. The research in this thesis deals with the existence and controllability results for some classes of first and second order impulsive differential systems with delay in Banach spaces. Initially, existence of solutions for various types of impulsive differential and integrodifferential systems with delay are discussed. Further, the sufficient conditions for controllability of some classes of impulsive differential and integrodifferential systems with finite and infinite delay are established. Our approach and technique of proofs are based on fixed point theorems such as Darbo-Sadovskii fixed point theorem and Monch fixed point theorem via measures of noncompactness. Examples and applications are provided to illustrate the theory.