South East Asian J. of Math. & Math. Sci. **ISSN : 0972-7752**
Vol.14, No.2 (2018), pp. 45 - 50

Some Results in Fixed Point Theorems for Asymptotically Regular Mappings in *G*-Matric Spaces

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Abstract : In this paper we extend some results of fixed points for asymptotically regular mappings on a complete G-metric spaces by using new approach.

Keywords and phrases : Asymptotically Regular Mapping, Fixed Point, G-Cauchy sequence, G –Metric spaces.

1. Intoduction

Banach fixed point theorem is an important tool in the theory of metric spaces, it guarantees the existence and uniqueness of fixed points of self maps of metric spaces. The concept of asymptotically regular at a point in a space was first introduced by Browder and Petryshyn. In this paper we have proved some results in Complete G-metric space under asymptotic regularity with some contractive condition.

2 Definition and Preliminaries :

Definition : 2.1

Let X be a non empty set, and let $G : X \times X \times X \to R^+$ be a function satisfying the following properties.

(1) $G(x, y, z) = 0$ if $x = y = z$.

(2) $G(x, x, y) > 0$; for all $x, y \in X$ with $x \neq y$.

(3) $G(x, x, y) \leq G(x, y, z)$ for all x, y, z with $y \neq z$

(4) $G(x, y, z) = G(x, z, y) = G(y, x, z) = \ldots$ (Symmetry in all three variables)

(5) $G(x, y, z) \leq G(x, a, a) + G(a, y, z)$ for all $x, y, z, a \in X$ (rectangle inequality)

Then the function G is called a generalized metric or more specifically a G-metric on X and the pair (X, G) is called a G-metric space.