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SOME COMMON FIXED POINT THEOREMS FOR WEAKLY COMMUTING MAPS IN $\mathcal{L}$-FUZZY METRIC SPACES

Donal O'Regan[a] and Reza Saadati[b,1]

[a] Department of Mathematics
National University of Ireland, Galway, Ireland

[b]Department of Mathematics, Science and Research Branch
AIslamic Azad University, Post Code 14778, Ashrafi Esfahani Ave, Tehran, Iran

Abstract. In this paper we prove two common fixed point theorems in generalized fuzzy and intuitioistic fuzzy metric spaces i.e., $\mathcal{L}$-fuzzy metric space.

Keywords. $\mathcal{L}$-Fuzzy contractive mapping; Complete $\mathcal{L}$-fuzzy metric space; Fixed point theorem.

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1 Introduction and Preliminaries

The notion of fuzzy sets was introduced by Zadeh [22]. Various concepts of fuzzy metric spaces were considered in [6, 7, 12, 13]. Many authors have studied fixed point theory in fuzzy metric spaces; see for example [2, 3, 9, 10, 11, 15, 16, 21]. In the sequel, we shall adopt the usual terminology, notation and conventions of $\mathcal{L}$-fuzzy metric spaces introduced by Saadati et al. [18] which are a generalization of fuzzy metric sapces [8] and intuitionistic fuzzy metric spaces [17, 19].

Definition 1.1 ([9]) Let $\mathcal{L} = (L, \leq_L)$ be a complete lattice, and U a non-empty set called a universe. An $\mathcal{L}$-fuzzy set $\mathcal{A}$ on U is defined as a mapping $\mathcal{A} : U \longrightarrow L$. For each u in U, $\mathcal{A}(u)$ represents the degree (in L) to which u satisfies $\mathcal{A}$.

Lemma 1.2 ([4, 5]) *Consider the set L^* and the operation $\leq_{L^*}$ defined by:*

$$L^* = \{(x_1, x_2) : (x_1, x_2) \in [0,1]^2 \text{ and } x_1 + x_2 \leq 1\},$$

$(x_1, x_2) \leq_{L^*} (y_1, y_2) \Longleftrightarrow x_1 \leq y_1$ and $x_2 \geq y_2$, for every $(x_1, x_2), (y_1, y_2) \in L^*$. Then $(L^*, \leq_{L^*})$ is a complete lattice .

Classically, a triangular norm T on $([0,1], \leq)$ is defined as an increasing, commutative, associative mapping $T : [0,1]^2 \to [0,1]$ satisfying $T(1, x) = x$,

[1]Corresponding Author