

$fg\delta$ -CLOSED SET AND $fg\delta$ -CONTINUITY

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Abstract : In this paper a new type of generalized version of fuzzy closed set viz., $fg\delta$ -closed set is introduced and studied. Then the mutual relationships of this set with the sets defined in (Azad, 1981, Balasubramanian and Sundaram, 1997 and Bhattacharyya, 2013, 2016, 2017) are established. Afterwards, a new type of closure operator is introduced, using $fg\delta$ -closed set as a basic tool, which is an idempotent operator. It is shown that the collection of all $fg\delta$ -closed sets in a fuzzy topological space (Chang, 1968) is strictly larger than that of fuzzy closed set (Chang, 1968), fg -closed set (Balasubramanian and Sundaram, 1997 and Bhattacharyya, 2013), fwg -closed set (Bhattacharyya, 2017), fmg -closed set (Bhattacharyya, 2017), fgs^* -closed set (Bhattacharyya, 2017), fs^*g -closed set (Bhattacharyya, 2016), $fswg$ -closed set (Bhattacharyya, 2016), fgp -closed set (Bhattacharyya, 2013), fpg -closed set (Bhattacharyya, 2013), $fg\alpha$ -closed set (Bhattacharyya, 2013), $f\alpha g$ -closed set (Bhattacharyya, 2013). Next we introduce $fg\delta$ -open and $fg\delta$ -closed functions. Also $fg\delta$ -continuous and $fg\delta$ -irresolute functions are introduced and studied. Also establish the mutual relationships of these functions with the functions defined in (Azad, 1981, Balasubramanian and Sundaram, 1997 and Bhattacharyya, 2013, 2016, 2017, 2020, 2022). After that we introduce $fg\delta$ -regular, $fg\delta$ -normal and $fg\delta$ -compact, $fg\delta$ - T_2 -spaces and the applications of the functions defined in this paper on these spaces are discussed.

AMS Subject Classifications: 54A40, 03E72

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1. Introduction. fg -closed set is introduced in (Balasubramanian and Sundaram, 1997 and Bhattacharyya, 2013). Afterwards, different types of generalized version of fuzzy closed sets are introduced and studied. In this context, we have to mention (Bhattacharyya, 2013, 2016, 2017, 2020). Using fuzzy regular open set as a basic tool, here we introduce and study $fg\delta$ -closed set.

2. Preliminaries. Throughout this paper (X, τ) or simply by X we shall mean a fuzzy topological space (fts, for short) in the sense of Chang (Chang, 1968). In (Zadeh,

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