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ψ-$\mathscr{I}$-CLOSED SET, WEAKLY ψ-$\mathscr{I}$-CLOSED SET AND CONTRA ψ-$\mathscr{I}$-CONTINUOUS MAPPING IN IDEAL TOPOLOGICAL SPACES

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Abstract. In this paper, we introduce and study some basic properties of new classes of sets called ψ-$\mathscr{I}$-closed sets and weakly ψ-$\mathscr{I}$-closed sets. Moreover, we offer a new type of contra-continuous function in the context of ideal topology called contra-ψ-$\mathscr{I}$ continuous function and present its fundamental properties.

1. Introduction

Without doubt, the research works of Hamlett and Janković in the application of topological ideals to generalize the most rudimentary general topological properties evinced its usefulness and richness as a promising research area (see [22], [23], [24] and [28]). Since then many researchers have contributed to this field, among others, Abd El-Monsef, Arenas, Dontchev, Ergun, Ganster, Gupta , Jafari, Jayasudha, Lashien, Maki, Nasef, Noiri, Parimala, Rajesh, Rose, Umehara, Viswanathan and Ekici.
In 1992, Janković and Hamlett [28] introduced the notion of $\mathscr{I}$-open sets in an ideal topological space which is a topological space and an ideal $\mathscr{I}$ on it. Abd El-Monsef et al. [1] further investigated $\mathscr{I}$-open sets and $\mathscr{I}$-continuous functions. Throughout this paper, $int(A)$ and $cl(A)$ denote the interior and closure of A, respectively. An ideal $\mathscr{I}$ on a topological space (X, τ) is a nonempty collection of subsets of x which satisfies (i) A $\in \mathscr{I}$ and B $\subset$ A implies B $\in$ A implies B $\in \mathscr{I}$ and (ii) A $\in \mathscr{I}$ and B $\in \mathscr{I}$ implies A $\cup$ B $\in \mathscr{I}$. Given a topological space (X, τ) with an ideal $\mathscr{I}$ on X and if $\mathscr{P}$(X) is the set of all subsets of X, then the set operator $(.)^*$: $\mathscr{P}$(X)$\rightarrow$ $\mathscr{P}(X)$, called the local function of A with respect to τ and $\mathscr{I}$, is defined as follows: For A $\subset$ X, $A^*(\tau, \mathscr{I}) = \{x \in X : U \cap A \notin \mathscr{I}\}$, for every open set U of X containing x. A Kuratowski closure operator $cl^*(.)$ for a topology $\tau^*(\tau, \mathscr{I})$ called the $*$-topology, finer

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