

## CHARACTERIZATIONS OF J, J\*, J\*\* -CLOSED SETS IN TOPOLOGICAL SPACES

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**Abstract.** In this paper, J, J\* and J\*\* - closed sets are introduced in topological spaces. The relationships of these closed sets are analysed with some existing g - closed sets in the literature. In spaces like  $T_{1/2}$ , almost weakly Hausdorff,  $T_\delta$ , semi - regular,  $T_b$ ,  $\alpha T_b$ , partition space,  $R_1$ , these closed sets are characterized.

### 1. Introduction

In 1937, Stone [32] introduced regular open sets and used it to define the semiregularization of a topological space. In 1968, Velicko [36] proposed  $\delta$  - open sets which are stronger than open sets. Levine [17] has brought generalized closed sets in 1970. Dunham [10] has established a generalized closure using Levine's generalized closed sets as  $Cl^*$ . In 2016, Pious Missier [29] has introduced regular\* - open sets using  $Cl^*$ . In 2018, Meenakshi and Sivakamasundari [21] have introduced a class of new sets namely  $\eta^*$  - open sets which is placed between the classes of  $\delta$  - open sets and open sets. Its basic properties are obtained and the concepts of  $\eta^*$  - cluster point,  $\eta^*$  - adherent point and a  $\eta^*$  - derived set are introduced and studied in the same paper. Using  $\eta^*$  - open sets, they have also introduced J - closed sets [20] and their properties are studied. Moreover  $g$  - closed  $\rightarrow$  J - closed set  $\rightarrow$   $g\delta$  - closed set [7] and  $\delta g$  - closed set [8]  $\rightarrow$  J\* - closed set  $\rightarrow$   $g$  - closed set,  $\delta g$  - closed set  $\rightarrow$  J\*\* - closed set  $\rightarrow$   $g$  - closed set. In this paper, J, J\* and J\*\* - closed sets are introduced in topological spaces. The relationships of these closed sets are analysed with some existing  $g$  - closed sets in the literature. In spaces like  $T_{1/2}$  [17], almost weakly Hausdorff [8],  $T_\delta$  [8], semi-regular,  $T_b$  [6],  $\alpha T_b$  [5], Partition space [25],  $R_1$  [4] these closed sets are characterized.

Some basic definitions and results in topological spaces are needed which are given in section 2 and will be used in the sequel. Throughout this paper,  $(Y, \zeta)$  will always denote a topological space.

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