ABSTRACT

Topology is the most important branch of Mathematics that deals with geometric structure that are invariant under continuous deformation. In particular, General topology on a set is a topology that is constructed using set theoretic operations such as union, intersection and complement, etc., In General Topology, the notions of open sets and closed sets are applied to characterize different topological spaces in a given set. Hence a study of generalization of closed sets or open sets and their characterization is very important in the field of General Topology.

The notion of soft topology initiated and investigated by Shabir & Naz and Cagman et al. using the concept of soft set introduced by Molodsov, is a powerful mathematical tool for dealing the uncertainties in the real world problems. Soft sets are very useful to solve the decision making problems in the field of science, engineering and economics, etc., Many researchers (Kannan Yuksel et al. Mahanta & Das and Kandil et al.) introduced various generalizations of soft closed and soft open sets and investigated their properties.

This thesis mainly deals with soft g* closed sets and soft $\tilde{\gamma}$ open sets and investigated some of their basic and fundamental properties in soft topological space. Also, the concept of continuity such as soft g* continuous, soft g* homeomorphism, soft slightly g* continuous, soft $(\tilde{\gamma},\tilde{\beta})$ continuous, soft $\tilde{\gamma}$ continuous, soft $\tilde{\gamma}$ contra continuous, soft $(\tilde{\gamma},\tilde{\beta})$ contra continuous, soft $\tilde{\beta}$ contra continuous, soft $(\tilde{\gamma},\tilde{\beta})$ semi continuous mappings are introduced and some of their properties are studied. Further, the soft g* T_0, soft g* $T_{\frac{1}{2}}$, soft g* $T_{\frac{1}{2}}$*, soft g* T_1, soft g* T_2, soft $\tilde{\gamma}$ T_0, soft $\tilde{\gamma}$ $T_{\frac{1}{2}}$, soft $\tilde{\gamma}$ T_1,

soft $\tilde{\gamma}$ T_2, soft $\tilde{\gamma}$ semi T_0, soft $\tilde{\gamma}$ semi $T_{\frac{1}{2}}$, soft $\tilde{\gamma}$ semi T_1, soft $\tilde{\gamma}$ semi T_2 spaces are developed and their relationship between them are analyzed. Finally, soft $\tilde{\gamma}$ T_b, soft $\tilde{\gamma}$ T_d and soft $\tilde{\gamma}$ T_{gs} spaces are generated and some of their properties are studied.

In Chapter 2, the concept of new type of soft closed set called soft g* closed set is introduced in the soft topological space $(X, \tilde{\tau}, E)$ and some of its properties are studied. Further, the notion of soft g* T_i (i = 0, ½, 1, 2) spaces are defined and characterized through soft g* closure and soft g* interior operators. Finally, soft g* regular and soft g* normal spaces are introduced and some of their characterizations are studied.

In Chapter 3, the notion of soft g* continuous mapping is introduced and some of the properties are investigated. Further, the concept of soft g* irresolute, soft g* open, soft g* closed mappings and soft g* homeomorphism are studied. Also, the new class of mapping called soft slightly g* continuous mapping is defined and some of its basic concepts are investigated.

In Chapter 4, the operation $(\tilde{\gamma})$ approaches on soft sets are introduced and using the concept of operations on soft set, soft $\tilde{\gamma}$ open set is generated and investigated some of its basic properties. Further, the notion of soft $\tilde{\gamma}$ T_i (i = 0, ½, 1, 2) spaces are studied and characterized. Moreover, soft $\tilde{\gamma}$ regular and soft $\tilde{\gamma}$ normal spaces are generated and some of their soft topological properties are investigated.

In Chapter 5, the concept of soft $(\tilde{\gamma}, \tilde{\beta})$ continuous mapping, soft $\tilde{\gamma}$ continuous mapping, soft $(\tilde{\gamma}, \tilde{\beta})$ closed mapping and soft $(\tilde{\gamma}, \tilde{\beta})$ open mapping are introduced and some of their soft topological properties are

investigated. Finally, the notion of soft $\widetilde{\gamma}$ contra continuous, soft $(\widetilde{\gamma},\widetilde{\beta})$ contra continuous and soft $\widetilde{\beta}$ contra continuous mappings are obtained and some of their properties in soft topological spaces are studied.

In Chapter 6, the new class of soft open set called soft $\widetilde{\gamma}$ semi open set is introduced and studied some of its soft topological properties. Further, the notion of soft $\widetilde{\gamma}$ semi T_i (i = 0, ½, 1, 2) spaces are introduced and the relationships between them are investigated.

In Chapter 7, the concept of soft $(\widetilde{\gamma},\widetilde{\beta})$ semi continuous and soft $(\widetilde{\gamma},\widetilde{\beta})$ semi closed mappings are defined and discussed. Also, the concept of soft $\widetilde{\gamma}$ generalized semi closed set in a soft topological space $(X,\widetilde{\tau},E)$ is defined and studied. Finally, the notion of soft $\widetilde{\gamma}$ T_b, soft $\widetilde{\gamma}$ T_d and soft $\widetilde{\gamma}$ T_{gs} spaces are introduced and investigated the relationship between them.