ABSTRACT AND KEYWORDS

The thesis deals with the “study on Lattices of L-topologies”. It is arranged into five chapters. The thesis starts with an introduction to the topic of research. In the second chapter we generalize the concept ‘weakly induced space’ introduced by H.W. Martin using the tool (completely) Scott continuous functions and study the lattice structure of the set $W(X)$ of all weakly induced L-topologies on a given set $X$. For a given topology $\tau$ on $X$, we study properties of the lattice $W_\tau$ of weakly induced L-topologies defined by families of (completely) Scott continuous functions with reference to $\tau$ on $X$. From the lattice $W_\tau$ we deduce that the lattice $W(X)$ of all weakly induced L-topologies on $X$ is not complemented but join complemented and hence semi complemented. Also it is proved that induced L-topologies and crisp topologies do have complements.

The lattice structure of the set of all stratified L-topologies on a given set $X$ is investigated in the second chapter. It is a sublattice of the lattice of L-topologies on $X$. Here we prove that the lattice of stratified L-topologies is semi complemented and this lattice has atoms and dual atoms if and only if the membership lattice $L$ has atoms and dual atoms. It is also proved that this lattice is not atomic and dually atomic in general.

In the fourth chapter, we determine which subfamilies of L-topologies do possess minimum (maximum) and minimal (maximal) elements with respect to an L-topological property. Here the study is on the concept “complete homogeneity and reversibility” in general L-fuzzy set up and L-topology and characterize maximum (minimum) L-topological spaces. Also it is proved that the set of all completely homogeneous L-topological spaces forms a complete sublattice of the lattice of L-topologies and we observed that this lattice possesses atoms but it is not atomic and complemented.

Finally, we investigate the lattice structure of the set of all compact L-topologies on a given set $X$. It is proved that this lattice is complete, atomic but not modular and complemented.
Keywords: Weakly induced L-topology, induced L-topology, stratified L-topology, compact L-topology, complete lattice, atoms, dual atoms, join complements, meet complements, semi complements, complements, complete homogeneity, reversibility, L-subsets, L-topology, L-homeomorphism, L-topological property.