ABSTRACT

Uniform space plays a very important in the study of topological spaces. Uniform spaces have also been studied in the fuzzy set through the covering and entourage approaches over the last few decades. In this thesis, we undertake study of some generalisation of covering uniform structures in the $L-$topological setting.

The primary object of this thesis is to study various generalisation of covering uniform structures in $L-$ topological spaces to find the weakest topological structure to study the uniform structure in the $L-$topological spaces. This includes the development of covering $L-$ semi-uniform spaces and covering $L-$locally uniform spaces in the same setting. It also includes a study of their relation and various important topological notions such as completeness, compactness, the metrization problem, and other notion in the context of covering uniform spaces in $L-$topological spaces.

The notion of covering $L-$semi-uniform space(In short CLS-Uniform spaces) in the category **C-TOP** is introduced by generalising Garcia et al. covering $L-$uniform spaces. CLS-uniform space are shown to be interior spaces and condition for CLS-uniform space to be $L-$topological is obtained. A notion of generalised uniformly continuous functions on CLS-uniform spaces is introduced and study is carried out respect to interior spaces. The metrizability result is obtained in the developed notion. Further, the relation between $L-$fuzzy basic proximity (in short $L-$fbps) and CLS-uniform space is also obtained and it turns out that CLS$-$uniform space is totally bounded if $L-$fbps induce it.

Another generalised covering uniform structure in the form of covering $L-$locally uniform space is introduced which is stronger than CLS-uniform space but weaker

than covering $L-$uniform space. The structure is then examined in relation to various existing notions including the interior operator, closure operator, characterisation of $L-$topological space, and weakly uniformly continuous function. Further, metrizability result, completeness, compactness and totally boundedness are also studied in the context of covering $L-$locally uniform spaces.

The relationship among these notions that have been developed is presented along with various examples and counterexamples on newly developed notion of generalised covering uniform structures. In a nutshell, the work done in this thesis had tried to fill some of gape spaces in the theory of fuzzy uniform structure. In the concluding part, outlined the implication of the work and suggest some future work that can be undertaken as a sequel of this work.