Organization of the Thesis

This thesis has been organized into six chapters, each chapter consisting of several sections.

CHAPTER- 1: Introduction, Literature Review, and Basic Concepts

CHAPTER- 2: Cardinalities of the Neutrosophic Set and Neutrosophic Crisp Set on a Finite Set

CHAPTER- 3: Number of Neutrosophic Topological Spaces on a Finite Set

CHAPTER- 4: On the Structure of Number of Neutrosophic Clopen Topological Spaces on a Finite Set

CHAPTER- 5: Number of Neutrosophic Crisp Topological Spaces on a Finite Set

CHAPTER- 6: Summary and Conclusion

Now, a brief discussion of our research topics is as follows:

CHAPTER- 1: This introductory chapter introduces some basic concepts of Neutrosophic set theory, Neutrosophic topology, and their importance. Also, in this chapter, a literature survey of the various approaches, such as fuzzy set, intuitionistic fuzzy set, neutrosophic set, neutrosophic crisp set, fuzzy topology, intuitionistic fuzzy topology, neutro-

sophic topology, neutrosophic crisp topology, neutrosophic bitopological spaces, neutrosophic tritopological spaces, and the number of topological spaces have been discussed. In this chapter, some preparatory works have also given, which is necessary for the later chapters.

CHAPTER- 2: In this chapter, for a non-empty finite set $\mathscr{X}$ with neutrosophic values in $\mathscr{M}$ and $|\mathscr{M}| = m \geq 2$, the cardinalities of the neutrosophic set and the cardinalities of the neutrosophic crisp set have been studied. The number of chains in the neutrosophic set that have a cardinality less than four has also been counted. Additionally, some interesting propositions have been explored.

CHAPTER- 3: In this chapter, the number of neutrosophic topological spaces having two, three, and four neutrosophic open sets has been computed for a finite set $\mathscr{X}$ whose neutrosophic values lie in $\mathscr{M}$. Further, the number of neutrosophic bitopological spaces and neutrosophic tritopological spaces having $k(k = 2, 3, 4)$ neutrosophic open sets on finite sets have been computed.

CHAPTER- 4 : The formulae for calculating neutrosophic clopen topological spaces having two, three, four, and five neutrosophic open sets are computed in this chapter based on $\mathscr{M}$. In addition, other formulae-related properties have been discovered. The formulae for calculating the number of neutrosophic clopen bitopological spaces with (k, k)-open sets, (k, l)-open sets, and k & l-open sets are also included in this chapter. Besides that, this chapter offers formulae for calculating the number of neutrosophic clopen tritopological spaces having, respectively, (k, k, k)-open sets, (k, k, l)-open sets, (k, l, m)-open sets, k & l-open sets, and k, l & m-open sets. The outcomes are clear and productive.

CHAPTER- 5: In this chapter, the formulae for obtaining the number of neutrosophic crisp topological spaces having two, three, and four neutrosophic crisp open sets are computed and related results are discussed.

CHAPTER- 6: In this chapter, a summary of the thesis is discussed, and this chapter also includes some limitations and future work.

BIBLIOGRAPHY: Detailed references to relevant literature are given in the final part of the thesis.