



The Study of Topological Properties and its Application

- Akanksha Kumari
- Sonam Priya
- Alka Kumari

Received : November 2019

Accepted : March 2020

Corresponding Author : Alka Kumari

Abstract : *Topology being a new field of research deals with all abstract properties of shapes (not in a literal sense).*

We all are curious to know something new in our life, and topology follows that curiosity. What do we mean by the concept of 'shape'? What does it mean to say that an object has a 'hole' in it? And is the hole in the centre of a basketball net the same as the hole in the centre of a doughnut? What a rigorous and mathematical means of establishing that two objects are equivalent- from the point of view of shape and form? These are the types of questions that we consider in the subject of topology. Dawn topology can be considered by Euler's published paper in 1736 on the solution of the Königsberg bridge problem. After that topology found its genesis in the mathematical works of Jules Henri Poincare (1854-1912).

The axioms are merely a springboard for "rubber sheet geometry". By abstracting the notion of openness, we can now make sense of continuity in a way that's more general than what we might learn in calculus classes. Continuity is an essential ingredient to the bending, twisting, and stretching— but not tearing— of shapes that we hear about. The 'no thearing' part is precisely what continuity means. From the abstract properties of topology we studied the wonderful structure of Moebius strip and Kleinbottle.

Keywords: *Topological spaces, compactness, connectedness, topological equivalent, Moebius strip, Klein bottle*

Akanksha Kumari

B.Sc. III year, Mathematics (Hons.), Session: 2017-2020,
Patna Women's College, Patna University, Patna,
Bihar, India

Sonam Priya

B.Sc. III year, Mathematics (Hons.), Session: 2017-2020,
Patna Women's College, Patna University, Patna,
Bihar, India

Alka Kumari

Head, Department of Mathematics,
Patna Women's College, Bailey Road,
Patna - 800001, Bihar, India
E-mail - alkaranjanedu@gmail.com

Introduction :

Topology is a newly born child of twentieth century's mathematical thinking. It has been allowed to consider the shape and structure of an object without being wedded to its size or to the distance between its component parts. Topology is by its very nature abstract. Traditionally it follows the Euclidean paradigm of formulating axioms and definitions and then proving theorems. Topology found its genesis in the mathematical works of Jules Henri Poincare. It has been a burgeoning part of mathematics ever since. The first actual use of the word "topology" was in the treatise *Vorstudieren zur Topologie* by Johann Listing (1808-1882). In the past 50 years topology has played an