# Analysis of Various Invariants in Ortho and Para Network

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**Abstract**

Chemical Structures are being studied to understand the insight of mathematical models of chemical molecules and this phenomenon is known as chemical graph theory. In this aspect, the role of topological indices (which tag each chemical structure) is vital in making the difference between the base of molecules and their branching pattern. It is also a technique used to explain the characteristics of compounds such as temperature and oscillation during their chemical reaction. These are million in counting which is based on a single edge but in this article, we try to enhance this idea for a path of length two between certain pair (i, j) ϵV (G) and calculate productive and compact informative results which are numerically and graphically representing better results than single edge formulas by using this notion by edge path we can drive smoothly millions of existing formulas of topological indices Bi-distance edge-based topological indices. In this article, we calculate different Bi-Distance degree-based topological indices namely; Randic index, Forgotten index, Arithmetic Geometric index, Geometric Arithmetic index, Zagreb indices, Sanskruti index, Second Arithmetic Geometric index, and Forth Atom-bond Connectivity index for Ortho and Para Network.

**Keywords:** Chain of Ortho network, Para network, Bi-Distance and Topological indices.

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## 1. Introduction

There are no loops in the graphs in this paper because they are all simple, undirected, and finite. It is a mathematical branch dealing with networks of points (dots or nodes) connected by lines (edges or links). Graph theory has its roots in 1735, when Leonhard Euler, a Swiss mathematician, solved the Knigsburg bridge problem [1]. There is a wide range of applications for graphs in physical, biological, social, and information systems, operation research and they can be used for modeling many types of relationships and processes.

A graph theory can be applied to a variety of fields, from finding communities in networks in social media to tracking the spread of COVID19 through contacts in the community, in Google maps to find the shortest path, for deep study of DNA structure, molecular and atomic observation in chemistry and computer network security [2-5]. It has grown from a recreational subject to a significant branch of mathematical research used to organize ideas