

On Some Scientific Results of Abid-Waheed Graph $(AW)_r^7$

Abid Mehboob¹, Muhammad Waheed Rasheed², Iqra Hanif³

¹Department of Mathematics, Division of Science and Technology, University of Education, Lahore, Pakistan.

^{2,3}Department of Mathematics, University of Education Lahore, Vehari Campus, Pakistan.
abid.mahboob@ue.edu.pk¹, waheedrasheed461@gmail.com², iqrahanif955@gmail.com³

Abstract

Graphs are the representation of data in pictorial form. The use of graph theory is increasing day by day. Abid Waheed graph can be utilized in computer networking. The graph invariant or topological index is a numeric number used to explore the properties of the different graphs without experiments just by correlation coefficients. The Wiener index and its modification called hyper wiener index are both distance-based. In this paper we calculate the Wiener index (WI), hyper Wiener (HW) index of newly defined "Abid Waheed graph $(AW)_r^7$ " by the mean of Hosoya polynomial.

Keywords: Graph theory, Topological index, Distance, Hosoya polynomial, Wiener index, Abid Waheed Graph.

1. Introduction

Graphs are mathematical representations of networks that show the relationship between points and lines of the network. Leonhard Euler [1], one of the most renowned mathematicians of the 18th century developed the idea of graphs in the 18th century. Graph theory is commonly associated with his work on the famous "Seven Bridges of Knigsberg" problem. In physical, biological, social, and information systems, graphs can be used to model many types of relationships and processes. In recent days graph theory has been useful in finding communities in networks, including social media, and identified COVID19 in the community through contacts, determining rankings for web links in search engines, identifying molecules and atoms in chemistry, and studying computer network security [2-5].

The mathematics of chemistry is the subject of research concerned with new applications of mathematics. A molecular graph in mathematical chemistry can be characterized by a variety of topological indices, and these are invariant with respect to graph automorphism. The topological index is a numerical quantity that is derived from the structure graph of a molecule in an unambiguous manner. For more investigation about TIs see [6-9]. The graph invariant, no matter how graph is labeled or illustrated doesn't depend on its representation. A number of topological indices can explain molecular size and shape.