RELATION BETWEEN GENERAL RANDIĆ INDEX AND GENERAL SUM CONNECTIVITY INDEX

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Abstract: The general Randić index is the sum of weights of $(d(u).d(v))^k$ for every edge uv of a molecular graph G. On the other hand general Sum-Connectivity index is the sum of the weights $(d(u) + d(v))^k$ for every edge uv of G, where k is a real number and d(u) is the degree of vertex u. Both families of topological indices are well known and closely related. In fact the correlation coefficient value of these two families of indices for the trees representing the Octane Isomers vary between 0.915 to 0.998. In the recent years these families of indices have been extensively explored and studied. The major research on these indices mostly consists of the application in QSPR/QSAR analysis, computation of these indices for various molecular graphs and bounds of the indices for certain graphs, satisfying certain conditions. The main focus of this paper is a comparative study on these two families of indices for various families of graphs. We find a few algebraic relationships between general Randić index and general Sum-connectivity index of certain graphs.

Keywords and Phrases: General Randić index, general Sum-connectivity index, Path graph, Star graph, Tree graph, r-Regular graph, complete Bipartite graph.

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1. Introduction

In 1975, Milan Randić [6] proposed the first genuine degree-based topological index to measure the extent of branching of the carbon-atom skeleton of saturated