CONTRA-HARMONIC INDEX AND POLYNOMIAL OF NANOTUBES AND NANOTORUS

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A topological index is a numerical value that characterizes the topology of a graph. Topological indices of molecular graphs are crucial in Chemical Graph Theory and can be utilized to examine the chemical properties of medications. Topological indices can be utilized for predicting the physical properties of some dangerous drugs without having costly and time-consuming laboratory experiments. In 1972, Gutman and Trinajstić introduced the first and second Zagreb indices. Then the first and second Zagreb polynomials were derived by Fath-Tabar in 2009. There are more than 3000 topological indices in the literature. The first objective of this study is to compute the Contra-Harmonic index which was defined by S.Ragavi and R. Sridevi in 2020 for some nanotubes and nanotorus, namely V-Phenyline Nanotube (VPHX[m,n]), V-Phenyline Nanotorus (VPHY(m.n)), H-Naphtalenic nanotubes (NHPX[m, n]). The second objective of the study is to define the topological polynomial using the Contra-Harmonic index and compute the polynomials for the aforesaid nano structures. Here, the hydrogen-suppressed chemical graphs of the nano compounds were considered to treat atoms as vertices and chemical bonds as the edges of the chemical graphs. The computed Contra-Harmonic indices and corresponding polynomials are expected to offer valuable insights into the physicochemical properties of these compounds, enhancing the understanding and applications of these nanostructures in drug design and related fields.

Keywords: Contra-Harmonic Index, Contra-Harmonic Exponential, Nano Compounds.