Multiplicative Zagreb indices of k-trees

Shaohui Wang

Department of Mathematics
The University of Mississippi

ABSTRACT

Let $G$ be a graph with vertex set $V(G)$ and edge set $E(G)$. The first generalized multiplicative Zagreb index of $G$ is $\prod_{1,c}(G) = \prod_{v \in V(G)} d(v)^c$, for a real number $c > 0$, and the second multiplicative Zagreb index is $\prod_{2}(G) = \prod_{uv \in E(G)} d(u)d(v)$, where $d(u), d(v)$ are the degrees of the vertices of $u, v$. The multiplicative Zagreb indices have been the focus of considerable research in computational chemistry dating back to Narumi and Katayama in 1980s. In this talk, we will generalize Narumi-Katayama index and the first multicative index, where $c = 1, 2$, respectively, and investigate the lower and upper bounds for both $\prod_{1,c}(G)$ and $\prod_{2}(G)$ when $G$ is a $k$-tree. Our results extend the results of Gutman for trees to $k$-trees. Additionally, we characterize the extremal graphs and determine the exact bounds of these indices of $k$-trees, which attain the lower and upper bounds.