

The H -join of arbitrary families of graphs

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The H -join of a family of graphs $\mathcal{G} = \{G_1, \dots, G_p\}$, also called the generalized composition, $H[G_1, \dots, G_p]$, where all graphs are undirected, simple and finite, is the graph obtained by replacing each vertex i of H by G_i and adding to the edges of all graphs in \mathcal{G} the edges of the join $G_i \vee G_j$, for every edge ij of H . For a long time the known expressions for the determination of the entire spectrum of the H -join in terms of the spectra of its components and an associated matrix were limited to families of regular graphs. In this work, we extend such a determination, as well as the determination of the characteristic polynomial, to families of arbitrary graphs.