Counting spanning trees in cobordism of two circulant graphs. (English) Zbl 1398.05058

Summary: We consider a family of graphs $H_n(s_1, \ldots, s_k; t_1, \ldots, t_\ell)$ that is a generalisation of the family of $I$-graphs, which, in turn, includes the generalized Petersen graphs. We present an explicit formula for the number $\tau(n)$ of spanning trees in these graphs in terms of the Chebyshev polynomials and find its asymptotics. Also, we show that the number of spanning trees can be represented in the form $\tau(n) = pna(n)^2$, where $a(n)$ is an integer sequence and $p$ is a prescribed integer depending on the number of even elements in the sequence $s_1, \ldots, s_k, t_1, \ldots, t_\ell$ and the parity of $n$.

MSC:
05C05 Trees
05C31 Graph polynomials
05C75 Structural characterization of families of graphs
05C30 Enumeration in graph theory
39A10 Additive difference equations

Keywords:
circulant graph; $I$-graph; Petersen graph; spanning tree; Chebyshev polynomial; Mahler measure

Full Text: DOI

References:


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