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CNP-EQUIVALENT CLASSES OF GRAPHS

Shikhi M. and Anil Kumar V.*

Department of Mathematics,
T.M.Govt. College, Vakkad P.O,
Tirur, Malappuram-676 502, Kerala, INDIA
E-mail: shikhianil@gmail.com

* Department of Mathematics,
University of Calicut,
Malappuram-673 635 Kerala, INDIA
E-mail: anil@uoc.ac.in

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Abstract: Let $G(V, E)$ be a simple graph of order n and let (u, v) denotes an unordered vertex pair of distinct vertices of G. The i-common neighbor set of G is defined as $N(G, i) = \{(u, v) : u, v \in V, u \neq v$ and $|N(u) \cap N(v)| = i\}$, for $1 \leq i \leq n - 2$. The polynomial $N[G; x] = \sum_{i=0}^{(n-2)} |N(G, i)|x^i$ is defined as the common neighbor polynomial of G. Two graphs G and H are said to be CNP-equivalent if and only if $N[G; x] = N[H; x]$. A graph H is said to be CNP-unique if H is CNP-equivalent to itself only. In this paper we identify some CNP- unique graphs and also some classes of graphs which are CNP-equivalent.

Keywords and Phrases: common neighbor polynomial, CNP- unique graphs.

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1. Introduction

While modelling the structure of a social network system, usually pairs of individuals with shared interests are represented by pairs of vertices with common neighbors. The number of such common neighbors serves as a measure of consensus and proclivities between the corresponding pair of individuals. These concepts motivate the authors to introduce the common neighbor polynomial of a graph and then to identify graphs with same common neighbor polynomial.

Let $G(V, E)$ be a simple graph of order n. Let (u, v) denotes an unordered vertex pair of distinct vertices of G. The i-common neighbor set of G is defined