

THE CLASSES OF BIREGULAR LEFTMOST GRAPH VARIETIES OF TYPE (2,0)

MITTREE KRAPEEDANG AND TIANG POOMSA-ARD

Abstract

Graph algebras establish a connection between directed graphs without multiple edges and special universal algebras of type (2,0). We say that a graph G satisfies a term equation $s \approx t$ if the corresponding graph algebra $A(G)$ satisfies $s \approx t$. A class of graphs \mathcal{V} is called a graph variety if $\mathcal{V} = \text{Mod}_g \overline{\Sigma}$ where Σ is a subset of $T(X) \times T(X)$. A graph variety $\mathcal{V}' = \text{Mod}_g \Sigma'$ is called a biregular leftmost graph variety if Σ' is a set of biregular leftmost term equations. A term equation $s \approx t$ is called an identity in a graph variety \mathcal{V} if $A(G)$ satisfies $s \approx t$ for all $G \in \mathcal{V}$. An identity $s \approx t$ of a graph variety \mathcal{V} is belong to the class \mathcal{V} whenever $\text{Mod}_g \{s \approx t\} = \mathcal{V}$.

In this paper we characterize the class of each biregular leftmost graph variety.

Key Words : *Varieties, Biregular leftmost graph varieties, Term, Identities, Class of graph variety, Binary algebra, Graph algebras.*

2000 Mathematics Subject Classification : 05C25, 08B15