

# REDUCIBILITY OF REGULAR GRAPHS-I

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## Abstract

In this paper we define the concept of reducibility in graph theory. We have studied reducibility of regular graphs. We characterize regular graphs having vertex reducibility number equal to  $k$ ,  $1 \leq k \leq 3$ .

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**Keywords:** reducibility; regular graphs; dominating set; and dominating number.

## 1. Introduction

The concept of reducibility is well studied for some classes of lattices by Bordalo and Monjardet [2]. In fact they proved that the class of pseudocomplemented lattices as well as the class of semimodular lattices is reducible. Kharat and Waphare [9] identified some classes of posets which are reducible. Further, they have introduced a concept of reducibility number for posets. We introduce analogous concepts in graphs.

For the undefined concepts and terminology we refer the reader to Wilson [14], Clark [3], Harary [6], West [13] and Tutte [12].

**Definition 1.1:** Let  $\mathcal{G}$  be a class of graphs satisfying some property  $P$ . A vertex (edge)  $v$  is called *deletable* with respect to  $\mathcal{G}$  if  $G - v \in \mathcal{G}$ . In general, a set  $S$  of vertices (edges) is called *deletable* with respect to  $\mathcal{G}$  if  $G - S \in \mathcal{G}$ . Generally, if  $|S| = k$  then we say that  $S$  is a  $k$ -deletable set.