INDUCED REGULAR PERFECT GRAPHS

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Abstract: A graph G is said to be $\mathcal{R}$-perfect if, for all induced subgraphs H of G, the induced regular independence number of each induced subgraph H is equal to its corresponding induced regular cover. Here, the induced regular independence number is the maximum number of vertices in H such that no two belong to the same induced regular subgraph in H, and the induced regular cover of H is the minimum number of induced regular subgraphs in H required to cover the vertex set of H. This article introduces the notion of induced regular perfect graphs or $\mathcal{R}$-perfect graphs through which we study the structural properties of $\mathcal{R}$-perfect graphs and identify a forbidden class of graphs for the same. This further leads to the characterization of $\mathcal{R}$-perfect biconnected graphs. With these results, we derive and prove a general characterization for $\mathcal{R}$-perfect graphs.

Keywords and Phrases: Perfect graphs, $\mathcal{F}$-perfect graphs, Regular graphs, $\mathcal{R}$-perfect graphs, Graph minors.

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1. Introduction

The graphs considered in this paper are finite, simple and undirected unless stated otherwise. All terminologies not defined in this paper are followed as in [1], [2] and [7]. Berge [1] defined the concept of perfect graphs in the year 1973. He defined two types of perfection: