COMBINATORIAL PROPERTIES OF GENERALIZED $M$-MATRICES*

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Abstract.

An $M_\vee$-matrix has the form $A = sI - B$ with $s \geq \rho(B)$ and $B^k$ is entrywise nonnegative for all sufficiently large integers $k$. In this paper, the existence of a preferred basis for a singular $M_\vee$-matrix $A = sI - B$ with $\text{index}(B) \leq 1$ is proven. Some equivalent conditions for the equality of the height and level characteristics of $A$ are studied. Well structured property of the reduced graph of $A$ is discussed. Also possibility of the existence of preferred basis for another generalization of $M$-matrices, known as $GM$-matrices, is studied.

Key words. Preferred basis, Quasi-preferred basis, Height characteristic, Level characteristic.

AMS subject classifications. 15A48, 15A21, 15A18, 05C50.

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