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UNICYCLIC GRAPHS WITH THE STRONG RECIPROCAL EIGENVALUE PROPERTY*

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Abstract. A graph G is bipartite if and only if the negative of each eigenvalue of G is also an eigenvalue of G. It is said that a graph has property (R), if G is nonsingular and the reciprocal of each of its eigenvalues is also an eigenvalue. Further, if the multiplicity of an eigenvalue equals that of its reciprocal, the graph is said to have property (SR). The trees with property (SR) have been recently characterized by Barik, Pati and Sarma. Barik, Neumann and Pati have shown that for trees the two properties are, in fact, equivalent. In this paper, the structure of a unicyclic graph with property (SR) is studied. It has been shown that such a graph is bipartite and is a corona (unless it has girth four). In the case it is not a corona, it is shown that the graph can have one of the three specified structures. Families of unicyclic graphs with property (SR) having each of these specific structures are provided.

Key words. Unicyclic graphs, Adjacency matrix, Corona, Perfect matching, Property (SR).

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