Inverse of Hermitian Adjacency Matrix of Mixed Bipartite Graphs

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Mixed graph D is a graph that can be obtained from a graph by orienting some of its edges. The Hermitian adjacency matrix of a mixed graph is defined to be the matrix $H = [h_{rs}]$ where $h_{rs} = i$ if $v_r v_s$ is an arc in D, $h_{rs} = -i$ if $v_s v_r$ is an arc in D, $h_{rs} = 1$ if $v_s v_r$ is a digon in D and $h_{rs} = 0$ otherwise. in this paper we investigate when the hermitian adjacency matrix of a bipartite graph is invertible, also we prove that for any tree mixed graph T with invertible hermitian adjacency matrix, H^{-1} is $\{0, \pm 1, \pm i\}$-matrix.

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