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ON THE SPECTRAL RADII OF QUASI-TREE GRAPHS AND QUASI-UNICYCLIC GRAPHS WITH K PENDANT VERTICES[*]

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Abstract. A connected graph $G = (V, E)$ is called a quasi-tree graph if there exists a vertex $u_0 \in V(G)$ such that $G - u_0$ is a tree. A connected graph $G = (V, E)$ is called a quasi-unicyclic graph if there exists a vertex $u_0 \in V(G)$ such that $G - u_0$ is a unicyclic graph. Set $\mathscr{T}(n, k) := \{G : G \text{ is a } n\text{-vertex quasi-tree graph with } k \text{ pendant vertices}\}$, and $\mathscr{T}(n, d_0, k) := \{G : G \in \mathscr{T}(n, k) \text{ and there is a vertex } u_0 \in V(G) \text{ such that } G - u_0 \text{ is a tree and } d_G(u_0) = d_0\}$. Similarly, set $\mathscr{U}(n, k) := \{G : G \text{ is a } n\text{-vertex quasi-unicyclic graph with } k \text{ pendant vertices}\}$, and $\mathscr{U}(n, d_0, k) := \{G : G \in \mathscr{U}(n, k) \text{ and there is a vertex } u_0 \in V(G) \text{ such that } G - u_0 \text{ is a unicyclic graph and } d_G(u_0) = d_0\}$. In this paper, the maximal spectral radii of all graphs in the sets $\mathscr{T}(n, k)$, $\mathscr{T}(n, d_0, k)$, $\mathscr{U}(n, k)$, and $\mathscr{U}(n, d_0, k)$, are determined. The corresponding extremal graphs are also characterized.

Key words. Quasi-tree graph, Quasi-unicyclic graph, Eigenvalues, Pendant vertex, Spectral radius.

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