Unicyclic and Bicyclic Graphs of Rank 5

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Let $A(G)$ be the adjacency matrix of G. The rank of $A(G)$ is called the *rank* of G and denoted by $r(G)$. The nullity of $A(G)$ is called the *nullity* of G and denoted by $\eta(G)$. It is known that the rank is equal to the difference from the order to the nullity of the graph, i.e., $r(G) = n - \eta(G)$. In 2007, Cheng *et al.* characterized all graphs of rank 2 or 3. But graphs of rank more than equal to 4 is difficult to characterize, up to now, only some special classes of graphs with rank 4 is known, i.e., trees, unicyclic and bicyclic graphs. In this talk, we will characterize unicyclic and bicyclic graphs of rank 5, respectively.