EDGE-GRAFTING THEOREMS ON PERMANENTS OF THE LAPLACIAN MATRICES OF GRAPHS AND THEIR APPLICATIONS

SHUCHAO LI†, YAN LI†, AND XIXI ZHANG†

Abstract. The trees, respectively unicyclic graphs, on \( n \) vertices with the smallest Laplacian permanent are studied. In this paper, by edge-grafting transformations, the \( n \)-vertex trees of given bipartition having the second and third smallest Laplacian permanent are identified. Similarly, the \( n \)-vertex bipartite unicyclic graphs of given bipartition having the first, second and third smallest Laplacian permanent are characterized. Consequently, the \( n \)-vertex bipartite unicyclic graphs with the first, second and third smallest Laplacian permanent are determined.

Key words. Laplacian matrix, Laplacian coefficient, Permanent, Tree, Unicyclic graph, Bipartition.

AMS subject classifications. 05C50, 05C05.