

## ON THE EDGE-BALANCE INDEX SETS OF $L$ -PRODUCT OF CYCLES

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**Abstract.** Let  $G$  be a simple graph with vertex set  $V(G)$  and edge set  $E(G)$ , and let  $\mathbb{Z}_2 = \{0, 1\}$ . Any edge labeling  $f$  induces a partial vertex labeling  $f^+ : V(G) \rightarrow \mathbb{Z}_2$  assigning 0 or 1 to  $f^+(v)$ ,  $v$  being an element of  $V(G)$ , depending on whether there are more 0-edges or 1-edges incident with  $v$ , and no label is given to  $f^+(v)$  otherwise. For each  $i \in \mathbb{Z}_2$ , let  $v_f(i) = |\{v \in V(G) : f^+(v) = i\}|$  and let  $e_f(i) = |\{e \in E(G) : f(e) = i\}|$ . An edge-labeling  $f$  of  $G$  is said to be edge-friendly if  $\{|e_f(0) - e_f(1)| \leq 1\}$ . The edge-balance index set of the graph  $G$  is defined as  $EBI(G) = \{|v_f(0) - v_f(1)| : f \text{ is edge-friendly.}\}$ . In this paper, exact values of the edge-balance index sets of  $L$ -product of cycles with cycles,  $C_n \times_L C_m$  are presented.

*Key words:* Edge labeling, edge-friendly labeling, cordiality, edge-balance index set,  $L$ -products, cycles.