

Uniquely Bi-embeddable Bipartite 2-regular Graphs

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A bipartite 2-regular graph is a bipartite graph G such that $G = C_{2n_1} \cup C_{2n_2} \cup \dots \cup C_{2n_k}$ with $k \geq 1$, i.e., G is a vertex disjoint union of bipartite cycles. We say that a bipartite graph $G(X, Y)$ is bi-embeddable if there is a bijection $\sigma : V(G) \rightarrow V(G)$ such that $\sigma(X) = X$, $\sigma(Y) = Y$ and $E(G) \cap E(\sigma(G)) = \emptyset$. In this paper, we completely characterized the bipartite 2-regular graphs which can be uniquely bi-embedded into their bipartite complements.

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