Equipartite gregarious strongly balanced butterfly systems

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An H-decomposition of the graph G is partition of the edge set of $E(G)$ such that each element of the partition induces a subgraph isomorphic to a H An H-decomposition of a equipartite graph $K_{n(m)}$ is said to be gregarious if each H in the decomposition has its vertices in $V(H)$ different partite sets. Here, for butterflies, we give necessary and sufficient conditions for existence of a gregarious strongly balanced butterfly decomposition of the complete equipartite graph $K_{n(m)}$ (with n parts, $n \geq 5$ of size m).

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