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Neighborhood conditions and edge-disjoint perfect matchings. (English) Zbl 0769.05073

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A graph G satisfies the all pairs neighborhood condition $\text{ANC}(G) \geq m$ if, for each pair x, y of vertices of G , we have $|N_G(x) \cup N_G(y)| \geq m$. Let k be a fixed positive integer and G a graph of even order n which satisfies the following conditions: (1) the minimum degree of G is at least $k + 1$; (2) the edge-connectivity of G is at least k and (3) $\text{ANC}(G) \geq n/2$. Then it is shown that for sufficiently large n , G contains k edge-disjoint perfect matchings. It is also shown that each of the conditions (1), (2) and (3) is necessary for G to contain k edge-disjoint perfect matchings.

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MSC:

05C70 Edge subsets with special properties (factorization, matching, partitioning, covering and packing, etc.)

05C99 Graph theory

Keywords:

all pairs neighborhood condition; edge-connectivity; edge-disjoint perfect matchings

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