

1060-05-85

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Alon and Friedland have shown that graphs which are the union of complete regular bipartite graphs have the maximum number of 1-factors over all graphs with the same degree sequence. In our work we consider all graphs with the same number of vertices and edges. We identify two families of graphs that have the maximum number of 1-factors: the almost regular graphs which are unions of complete regular bi-partite graphs, and complete graphs with a matching removed. The first family is determined using Alon and Friedland's bound. For the second family, we show that a graph transformation which is known to increase network reliability also increases the number of 1-factors. Applying the transformation in reverse we also identify the threshold graph that has the fewest number of 1-factors (Received March 22, 2010)