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MINIMAL BIREGULAR K-CRITICAL BIPARTITE GRAPHS

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A bipartite graph $G = (U \cup V, E)$ such that $k = |U| - |V| \geq 0$ is called *k-critical* if after deleting any k vertices from the set $|U|$ the remaining subgraph has a perfect matching.

Given positive integer values $n = |U|, m = |V|$ such that $k = n - m > 0$. *Bipartite k-critical design problem for* (n, m) is to find a k-critical bipartite graph $G = (U \cup V, E)$ of order $n+m$ that is k-critical, and is lexicographically minimum with respect to (Δ_U, Δ_V). In the talk we show that if $m(n-m+1)/n$ is integer, solutions of the this problem can be found among (a, b)-regular bipartite graphs of order $n + m$, with $a = m(n - m + 1)/n$, and $b = n - m + 1$.