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The Moore and Cage Problems on Mixed Graphs

The Moore and Cage Problems are two classical topics on Extremal Graph Theory. In both of them the goal is find regular graphs, in the first they have fixed diameter and maximum order and in the second the graphs have fixed girth and minimum order.

We study both problems on Mixed Graphs, a $Mixed\ regular\ graph$ is a (z,r)-graph, z-regular by arcs and r-regular by edges, a $(z,r;d)$-mixed Moore graph is a mixed graph with fixed diameter d and maximum order whereas a $[z,r;g]$-mixed cage is a mixed graph with fixed girth g and minimum order.