1077-05-2351   **Kathleen M. Ryan*** (`kmr207@lehigh.edu`) and **Garth Isaak** (`gi02@lehigh.edu`). *Degree Matrices of k-edge Colored Graphs.*

Given a k-edge colored graph on n vertices, we define the degree matrix M as the (k x n) matrix whose entry d_{ij} is the degree of color i at vertex v_j, where $1 \leq i \leq k$ and $1 \leq j \leq n$. Given such a matrix M, we address the question of when M is the degree matrix of a graph in a specified family such as the disjoint union of paths, the disjoint union of cycles, or grids. Surprisingly, in some of the seemingly most basic cases that we have considered, the question is equivalent to the constrained number partition problem, which in itself is a special version of the NP hard subset sum problem. In other cases, we discuss necessary and sufficient conditions for when M is realizable as a 2-edge colored graph of a specified family. (Received September 22, 2011)