

1133-90-23

**Murat Adivar\*** (madivar@uncfsu.edu), 1200 Murchison Rd, Fayetteville, NC 28301, and  
**Shu-Cherng Fang** (fang@ncsu.edu), Industrial and Systems Engineering, College of  
Engineering, Raleigh, NC 27695. *Convex Analysis and Duality over Discrete Domains.*

The aim of this paper is to establish a fundamental theory of convex analysis for the sets and functions over a discrete domain. By introducing conjugate/biconjugate functions and a discrete duality notion for the cones over discrete domains, we study duals of optimization problems whose decision parameters are integers. In particular, we construct duality theory for integer linear programming, provide a discrete version of Slater's condition that implies the strong duality and discuss the relationship between integrality and discrete convexity. (Received May 08, 2017)