,

INTRODUCTION TO GROUP THEORY – NMAG337

EXAM – JANUARY 10 2023

Problem 1. *Sylow's theorem – formulate and sketch proofs, include supporting lemmas, possibly show some applications.*

Problem 2. *Prove that the alternating group A_n is simple for all $n \geq 5$.*

Problem 3. *Prove that the dihedral group D_n (of all symmetries of a regular n-gon) is a semidirect of a cyclic group $\mathbb{Z}_n$ by $\mathbb{Z}_2$.*