

ORAL EXAMINATION

Minor area: Lie Groups

Definition of Lie groups and Lie algebras

Exponential map

Adjoint representation

Left invariant vector fields

Classification of low dimensional Lie algebras

Solvable and nilpotent Lie algebras

Examples ($SU(n)$, $SO(n)$, $Sp(n)$)

Killing form

Maximal Tori

Semisimple Lie algebras

Representations for $SU(2)$ and $SO(3)$

Texts: Curtis, Matrix groups (Ch.1Ch.9)

Ernest B. Vinberg, Linear Representations of Groups

Spivak, Introduction to Differential Geometry (Vol. I, Ch.10)