

ORAL EXAMINATION

Minor area: Representation Theory of Lie Groups

Lie groups, Lie algebras
Subgroups, subalgebras
Homomorphism, exponential maps
Nilpotent groups
Solvable groups
Semisimple groups
Cartan subalgebra, maximal tori
Roots, Dynkin diagram, Weyl group
Classification of complex semisimple Lie algebras
Real forms
Low dimensional isomorphisms
Finite dimensional representation theory of semisimple Lie algebras
Weights, dominant weights
Orthogonal, symplectic, and unitary representations
Concrete description of the representations of classical Lie groups
Spin representations
Young diagrams

Books:

Curtis, Matrix Groups
Sage-Walde, Introduction to Lie groups and Lie algebras
Humphreys, Introduction to Lie algebras and representation theory
Samelson, Lie algebra and representation theory
Adams, Lectures on Lie groups