ORAL EXAMINATION

Minor area: Representation Theory of Compact Groups

Reading material:

Serre:Linear Representations of Finite Groups (Part I)
Vinberg:Linear Representations of Groups
(Chapters IIV, exc. III.9)
Warner:Foundations of Differentiable Manifolds and Lie Groups
(Chapter III)

Topics:
I.Representations of discrete groups
Regular representation
Completely reducible representations
Irreducible representations
Characters
Schur's lemma
Orthogonality relations for characters
Examples (abelian groups, S_n, A_n, D_n, quaternion group)
Generalizations to compact groups

II.Representation theory of Lie groups
Lie groups and Lie algebras (definitions and basic concepts)
Continuous representations
Matrix elements of compact linear groups
Representation of Lie algebras
Adjoint representation
Examples (especially subgroups of GL(n))
Representations of SU(2) and SO(3)