博士班資格考試筆試各科目考試範圍與參考書目

Guidelines of Qualify Exams for admission to official candidacy for the PhD degree

近世代數(Modern Algebra)

考試範圍(參考書目一至五章大部份內容)：

(Scope: most of Ch.1-5, Hungerford (1974))

Groups:

1. Homomorphisms and Subgroups
2. Cyclic Groups
3. Cosets and Counting
4. Normality, Quotient Groups, and Homomorphisms
5. Symmetric, Alternating, and Dihedral Groups
6. Direct Product and Direct Sums
7. Free Abelian Groups
8. Finitely Generated Abelian Groups
9. The Action of a Group on a Set
10. The Sylow Theorems
11. Classification of Finite Groups
12. Solvable Groups, Normal and Subnormal Series

Rings:

1. Rings and Homomorphisms
2. Ideals
3. Factorization in Commutative Rings,
4. Rings of Polynomials and Formal Power Series
5. Factorization in Polynomial Rings

Modules:

1. Modules, Homomorphisms and Exact Sequences
2. Free Modules and Vector Spaces
3. Modules over a Principal Ideal Domain

Fields:

1. Field Extensions
2. The Fundamental Theorem

3. Splitting Fields, Algebraic Closure and Normality
4. The Galois Group of a Polynomial
5. Finite Fields
6. Separability
7. Cyclic Extensions
8. Cyclotomic Extensions
9. Radical Extensions

參考書目 (References):

[1] Hungerford: Algebra, Springer, 1974.