Elective Paper-III-ALGEBRAIC THEORY OF NUMBERS
PMSA33A

Unit 1:

Algebraic background : Rings and fields -Factorization of polynomials -Field Extensions - Symmetric polynomial - Modules - Free Abelian Groups

Chapter: Sec **1.1 to 1.6**

Unit 2:

Algebraic Numbers: Algebraic numbers-Conjugates and Discriminant s - Algebraic Integers - Integral Bases - Norms and Traces - Rings of Integers

Chapter: Sec **2.1 to 2.6**

Unit 3:

Quadratic and Cyclotomic Fields : Quadratic fields and cyclotomic fields -Factorization into Irreducible : Trivial factorization - Factorization into irreducible - Examples of non-unique factorization into irreducible

Chapter: Sec **3.1,3.2** and **4.2 to 4.4**

Unit 4:

Prime factorization - euclidean domain- euclidean quadratic field- consequence of unique factorization- The Ramanugan -Nagell theorem

Chapter: Sec **4.5-4.9**

Unit 5:

Ideals:prime Factorization of Ideals- the norms of an Ideals- non unique factorization in cyclotomic field

Chapter: sec **5.2 to 5.4**

Recommended book :

I.Steward and D.Tall Algebraic number theory and Fermat's last Theorem
(3rd edition) A.K. peters limited., Natarick Mass 2002