20BSM310T					Modern Algebra					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	1	0	4	4	25	50	25	--	--	100

COURSE OBJECTIVES

- To introduce the Algebra of number system.
- To gain knowledge and skills to enable them to handle mathematical operations, analyses and problems involving Algebra.
- To introduce the use of Abstract Algebra in Real world
- To get familiar with the subject for better understanding of the advanced courses at a higher level.

UNIT 1 GROUP THEORY-I **10 Hrs.**

Some sets of numbers, Mappings, Binary composition, Equivalence relation, Equivalence class, Group, Examples of Groups, Properties of Groups, Subgroup.

UNIT 2 GROUP THEORY-II **10 Hrs.**

Order of an element, Cyclic Group, Cosets and Lagrange's theorem, Product of two subgroups, Normal subgroups, Quotient Groups, Commutator subgroup.

UNIT 3 HOMOMORPHISMS AND PERMUTATIONS, AUTOMORPHISM AND CONJUGATE ELEMENTS **11 Hrs.**

Homomorphism, Theorems on Homomorphisms, Correspondence theorems, Cayley's theorem, Permutation group, Automorphism, Theorems on Automorphisms, Conjugate elements, Applications of class equation of a group.

UNIT 4 INTRODUCTION TO RINGS AND FIELDS **09 Hrs.**

Ring, Examples of Ring, Some properties of Rings, Integral Domain and Field, Basic Theorems on Integral Domain and Field, Sub-ring.

40 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 – Identify the Groups, Rings and Fields based on their properties.
CO2 – Understand the basic idea of algebra of numbers and algebraic structures.
CO3 – Explain a rigorous mathematical proof for any given theorem.
CO4 – Discuss the application of abstract algebra in different fields of science and engineering.
CO5 – Appraise this subject so that it can be applied in other subjects or in higher studies.
CO6 – Develop the higher order thinking skills so as to understand the algebraic proofs.

TEXT/REFERENCE BOOKS

1. J. A. Gallian, Contemporary Abstract Algebra, 8th ed., Cengage Learning, 2013.
2. A. R. Vasishtha, A. K. Vasishtha, Modern Algebra, Krishna Prakashan Media (P) Ltd., 2002.
3. M. Artin, Algebra, 2nd ed., Pearson, 2010.
4. D. S. Dummit, R. M. Foote, Abstract Algebra, 3rd ed., John Wiley & Sons, 2003.
5. I. N. Herstein, Topics in Algebra, 2nd ed., John Wiley and Sons, 1975 .

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100 **Exam Duration: 3 Hrs.**

Part A: 6 questions of 4 marks each	24 Marks
Part B: 6 questions of 8 marks each	48 Marks
Part C: 2 questions of 14 marks each	28 Marks