19BSM805E – NUMBER THEORY										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	1	--	-	4	25	50	25	--	--	100

OBJECTIVES

1. Give the student a sense of basic idea of Number Theory
2. To understand the basic concepts of algorithms.
3. To study the basic concepts of Prime Numbers.
4. To understand the Congruences
5. To study the Primitive Roots and Quadratic Residues

SYLLABUS

Unit-I	**8**

Introduction: The Well Ordering Principle and Mathematical Induction, Divisibility and Division Algorithm: Integer Divisibility, Division algorithm, Greatest Common Divisor, Euclidean Algorithm.

UNIT II	**11**

PRIME NUMBERS: The infinitude of primes, The fundamental theorem of arithmetic, Least Common Multiple, Linear Diophantine Equations.

UNIT III	**9**

CONGRUENCES: Introduction to congruences, Residue Systems and Euler's phi function, Linear Congruences, The Chinese Remainder Theorem, Fermat Theorem

UNIT IV	**12**

PRIMITIVE ROOTS AND QUADRATIC RESIDUES: The order of integers and Primitive Roots, Primitive Roots for Primes, The Existence of Primitive Roots, Quadratic Residues and Nonresidues.

APPROXIMATE TOTAL	**40 Hours**

OUTCOMES

On completion of the course, student will be able to

1 - Understand the basic idea of number theory.

2 - Understand the different types of algorithms.

3 - Understand the concept of prime numbers.

4 - Apply algorithms

5 - Apply the concepts of Primitive Roots.

6 - Apply the concepts Quadratic Residues

TEXTS AND REFERENCES

1. George E. Andrews, Number Theory, Dover, New York, 1994.
2. George E. Andrews, The Theory of Partitions. Reprint of the 1976 original.,Cambridge Mathematical Library. Cambridge University Press, Cambridge,1998
3. Tom M. Apostol, Introduction to Analytic Number Theory. Springer, NewYork, 1976.
4. A. Baker, Transcendantal Number Theory, Cambridge University Press(London), 1975.
5. J.W.S. Cassels, An introduction to the Geometry of Numbers, Springer-Verlag (Berlin), 1971.
6. H. Davenport, Multiplicative Number Theory, 2nd edition, Springer-Verlag(New York), 1980