PAPER-M 307OE (G): MATHEMATICS FOR EVERYONE

UNIT-1: Basic Concepts in Mathematics

The number systems: Natural numbers, Integers, Rational and Irrational numbers, Real numbers, Complex numbers, Prime numbers.
The concept of Sets: Subsets and equality of sets, set operations (union, intersection, and difference).
Equivalence relations and types of functions (one-one, onto, many-one functions with examples)
Mathematical logic, methods of proof, Mathematical inductions.

UNIT-2: Elements of Higher Arithmetic

Divisibility: Divisibility, some theorems on divisibility, Primes, The Binomial theorem.
Congruences: Congruences, Solution of congruences, The Chinese Remainder theorem.

UNIT-3: Fundamental of Group Theory

Groups, subgroups, cyclic groups, normal subgroups. quotient groups, homomorphisms, natural homeomorphisms. kernel and image of a homomorphism and their properties. Isomorphism and fundamental theorem of homomorphism of groups.

UNIT-4: Elements of calculus

Functions of one variable: Limits, continuity and differentiations of functions of a single variable. Derivatives of composite functions, parametric functions, logarithmic functions, exponential and inverse functions.

Text Books:

1. Introduction to the theory of numbers, Ivan Niven, Herbert S. Zuckerman, Hugh L. Montgomery, 5th Edition, Wiley India Pvt. Ltd.
2. Contemporary abstract algebra, Joseph A. Gallian, Narosa Publication House.
3. Calculus Volume – I, T. M. Apostol, John Wiley & Sons.

Reference Books:

1. Introduction to Analytic Number theory, Tom M. Apostol, 1st edition, Narosa Book Distribution Pvt. Ltd.
2. Thomas' Calculus, George B. Thomas Jr. Maurice D. Weir, Joel R. Hass, 12th Edition, Pearson.
3. Abstract Algebra, David Dummit and Richard R. Foote, John Wiley & Sons.