SEMESTER- III

MIC-03: Real Analysis

Course Outcomes

After the completion of the course, the student will be able to:

CO1: Understand many properties of the real line and learn to define sequence in terms of functions.
CO2: Recognize bounded, convergent, divergent, Cauchy and monotonic sequences.
CO3: Apply tests for convergence and absolute convergence of an infinite series of real numbers.

MIC-03: Real Analysis (3 credits) Full Marks- 100		
Unit	**Topics to be covered**	**No. of Lectures**
1	Dedekind theory of real numbers, Algebraic and order properties of R, Archimedean Property, Density Theorem, Completeness property of R, Bounded sets, Theorems on Suprema and Infima.	10
2	Sequence and its convergence, Bounded sequence, Monotone sequences, Subsequences, Limit of a sequence, Limit Theorem, Bolzano-Weierstrass theorem for sequences, Cauchy sequence, Cauchy's general principle of convergence.	10
3	Infinite series and their convergence, Cauchy Criterion, Tests for convergence: Comparison test, D'Alembert Ratio Test, Cauchy's root test, Rabbe's test, Logarithmic test, Cauchy integral test, Gauss's test, Alternating series, Leibnitz test, Absolute and Conditional convergence.	10
	TOTAL	30

Book References:

1. Bartle, Robert G., & Sherbert, Donald R. (2015). Introduction to Real Analysis (4th ed.). Wiley India Edition. New Delhi.
2. Ross, Kenneth A. (2013). Elementary Analysis: The theory of calculus (2nd ed.). Undergraduate Texts in Mathematics, Springer. Indian Reprint.
3. Malik, S. C. & Arora, Savita. (2021). Mathematical Analysis (6th ed.). New Age International Publishers, New Delhi.
4. Jha,K.K. Advanced Course in Real Analysis and Higher Analysis. New Bharat Publishing House.