

Syllabus for B.A/B.Sc., Mathematics, Semester -III

Course Name: Complex Trigonometry and Theory of Equations (4 credits)

Course No: BMM-SEC-16301

Unit-I

Review of complex number system, triangle inequality, equation of a circle and ellipse in complex form, De Moivre's theorem and its applications, expansion of $\sin n\theta$, $\cos n\theta$ etc. in terms of powers of $\sin \theta$, $\cos \theta$ and expansion of $\sin^n \theta$ and $\cos^n \theta$ in terms of multiples of θ .

Unit-II

Functions of a complex variable, exponential, circular, hyperbolic, inverse hyperbolic and logarithmic functions of a complex variable and their properties, summation of trigonometric series, difference method, $C + iS$ method, $C-R$ equations, definition of analytic functions.

Unit-III

General properties of polynomials, graphical representation of polynomials, maximum and minimum values of polynomials, general properties of equation, Descartes's rule of signs positive and negative rule, relation between the roots and the coefficients of equations.

Unit-IV

Symmetric functions, applications symmetric function of the roots, transformation of equations, solutions of reciprocal and binomial equations, algebraic solutions of the cubic biquadratic, properties of the derived functions

Text Books Recommended

- 1.S.D. Chopra and M.L. Kochar and A.Aziz-ul-Auzeem, Differential Calculus (Thoroughly revised and enlarged new edition- 2004).
2. A.Aziz and N.A.Rather, Complex Trigonometry, KBS.
3. W.S.Burnside and A.W.Panton, The tHeory of Equations, Dublin University Press, 1954.
4. C.C.MacDuffee, Theory of Equations, John Wiley and Sons Inc., 1954

