

SPECIAL FUNCTIONS[Syllabus]

Beta and Gamma Functions:- Euler's First Integral, Euler's Second Integral, Gamma Function, ing the Gamma Function.

Legendre Functions:- Solution of the Legendre's differential equations, Legendre Function of the First Kind, Legendre Function of the First Kind, Orthogonal Property, Recurrence Formulae, Beltrami's Result, Christoffel's Expansion, Christoffel's Summation Formula, Rodrigue's Formula, Associated Legendre's Differential Equation, Orthogonal Property of Associated Legendre's Function, Recurrence Formulae for Associated Legendre Functions, Legendre's Function of the Second Kind $Q_n(x)$, Expansion of x^n in Legendre's Polynomials, Neumann's Integral, Recurrence Formula for $Q_n(x)$, Relations between $P_n(x)$ and $Q_n(x)$, Christoffel's Second Summation Formula.

Hypergeometric Functions:- Confluent Hypergeometric function or Kummer function, Solution of the Hypergeometric Equation, Integral Formula, Kummer's Theorem, Gauss's Theorem.46, Vandermonde's Theorem, Derivatives of Hypergeometric Functions, The Confluent Hypergeometric Functions, Whittaker Confluent Hypergeometric Functions, Differentiation of Confluent Hypergeometric Functions, Dixon's Theorem.

Bessel Functions:- Solution of the Bessel's Differential Equation, Recurrence Formulae.

Hermite Functions:- Solution of the Hermite Equation, Hermite Polynomials, Generating Function, Rodrigue's Formula, Orthogonal Properties of Hermite Polynomials, Recurrence Formulae.

Laguerre Functions:- Solution of Laguerre's Differential Equation, Laguerre Polynomials, Generating Function, Another Form of Laguerre Polynomials, Orthogonal Property of Laguerre Polynomials, Recurrence Formula, Associated Laguerre Polynomials, Generating Function for the Associated Laguerre Polynomial, Another Form of the Associated Laguerre Polynomial, Orthogonal Property of the Associated Laguerre Polynomials, Recurrence Formulae for Associated Laguerre Polynomials.

Chebyshev Functions:- Chebyshev Polynomials, First few Chebyshev Polynomials, Generating Functions, Orthogonal Properties of Chebyshev Polynomials.

***** ***** ***** ***** ***** ***** *****