

Vector spaces - Linear dependence of vectors, basis, linear transformations, rank and inverse of a matrix, solution of algebraic equations - consistency conditions. Eigenvalues and eigenvectors, Hermitian and skew Hermitian matrices.

Convergence of improper integrals, tests of convergence, Beta and Gamma functions elementary properties, differentiation under integral sign, differentiation of integrals with variable limits - Leibnitz rule, integrals dependent on a parameter - application.

Rectification, double and triple integrals, computations of surfaces and volumes, change of, variables in double integrals - Jacobians of transformations, integrals dependent on parameters - applications. Scalar and vector fields, level surfaces, directional derivative, Gradient, Curl, Divergence, Laplacian, line and surface integrals, theorems of Green. Gauss and Stokes, orthogonal curvilinear coordinates.

Finite differences, Newton's forward and backward interpolation formulae, Central difference interpolation. Trapezoidal rule and Simpson's 1/3rd rule of integration. Solution of polynomial and transcendental equations: bisection method, Newton Raphson method and Regula falsi method.