Engineering Mathematics-II

PART-A

Unit-I

System of Linear Equations: Rank of a matrix, Echelon form of matrix, Homogenous and Non-homogenous system of linear equations, consistency and inconsistency of system of equations, Gauss elimination method, Inverse of a matrix, Gauss-Jordon method.

Unit-II

Vector Spaces: Vector spaces, Subspaces, Linear independence and Linear dependence of vectors, Dimension and basis, Linear transformation, rank and nullity theorem (without proof), matrix associated with Linear Transformation, eigen values, eigen vectors, Cayley-Hamilton theorem, algebraic multiplicity, geometric multiplicity, similar and diagonalizable matrices.

PART-B

Unit-III

Ordinary Differential Equations: Formation of Differential Equations, Solution of Differential Equations, Initial and Boundary value problems, Solution of equations in separable form, equations reducible to separable form, Exact differential equations, integrating factors, Linear first order equations, Bernoulli equation, Riccati equation, Clairaut's equation, Higher order differential equation with constant coefficients and variable coefficients, Method of variation of parameters, Method of undetermined coefficients, finding particular integrals. Applications to electric RLC circuit, Deflection of beams, Simple harmonic motion, Simple population decay model, Orthogonal trajectories of a given family of curves.

Unit-IV

Partial Differential Equations: Formation of first and second order equations, solution of first order equations: Lagrange's equation, surfaces orthogonal to a given family of surfaces, non-linear first order equations, Charpit's method, Higher order Linear equations with constant coefficients.