

PAPER – II – ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS

UNIT – I

The general solution of the homogeneous equation – the use of known solution to find another – the method of variation parameter – power series solution.

UNIT – II

Regular singular points – Gauss's hypergeometric equation – the point at infinity – Legendra polynomial – Bessel functions – Properties of Legendra polynomials – Bessel functions – Properties of Legendra polynomials – Bessel functions.

UNIT – III

Linear systems of first order equations – Homogeneous equations with constant coefficients – the exact and uniqueness of solutions of initial value problems for first order ordinary differential equation – the method of successive approximation – Picard's theorem.

UNIT – IV

First order partial differential equation – Puffian differential equations – compactibility systems – Charpits method – Jocobi's method – Intergral surfaces through a given curve – Quasilinear equation – Nonlinear equation.

UNIT – V

Second order partial differential equation – Genesis solutions of second order partial differential equation – classification – one –dimensional wave equation – Laplace equation – Heat conduction problem – Duhamel's principle.

Text Books:

1. G.F.Simmons, Equations with applications and Historical notes, TMH, New Delhi, 1984.
2. T.Amarnath, An elementary course in partial differential equations, Narosa, 1999.
Chapters 1 and 2 (1.5 to 1.9, 1.11, 2.2, 2.3 (except 2.3.4, 2.4 (except 2.4.12, 2.4.13), 2.5 and 2.6.