

2226

## SECOND YEAR B. Sc. MATHEMATICS

### PAPER – II DIFFERENTIAL EQUATIONS

Duration: 3 Hours

Max. Marks: 75

#### UNIT - I

Exact differential equations and equations of special forms. Simultaneous differential equations. Total differential equations.

#### UNIT – II

Linear differential equations of second order and their solutions by:

- (i) The method of finding an integral of the C.F. by Inspection,
- (ii) Changing of independent variables,
- (iii) Removal of the first derivative,
- (iv) Operational factors,
- (v) Undetermined coefficients and
- (vi) Variation of parameters.

#### UNIT - III

Linear partial differential equations of first order: Lagrange's method, Integral surfaces passing through a given curve, orthogonal surfaces, Geometric description of  $Pp+Qq=R$ . Non-Linear partial differential equations of order one. Special methods of their solutions applicable to certain standard forms.

#### UNIT -IV

Charpit's method of solving non linear partial differential equations of first order, Monge's method of integration of equations  $Rr + Ss + Tt = V$ . Higher order homogeneous linear part of differential equation of the first order.

#### UNIT - V

Numerical solutions of ordinary differential equations: Introduction about initial value problem, boundary value problem, Euler's method, short comings. Euler's modified method. Picard's method of successive approximation and Picard's method for simultaneous equations.

#### References:

1. Ray and Sharma : Differential equation.
2. Bansal, Dhani : Differential equation (Vol. II).
3. Raisinghania, M.D. : Advanced differential equations.
4. Murray A. Daniel : Differential equation.
5. Forsyth, A.R. : A Treatise on Differential equation.
6. Ian N. Sneddon : Elements of Partial differential equations.,  
Mc Graw–Hill Book Company.
7. Gokhroo, Saini, Kumbhat : Avkal Samikaran.
8. Gokhroo, Saini, Ojha : Partial differential equations.
9. Codington, E.A. : An introduction to ordinary differential equation by,  
Prenticehall of India.