

MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR  
SECOND YEAR  
B. Sc. MATHEMATICS 2016-17  
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 partial 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, Dharmi : 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.