

**MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR**  
**FIRST YEAR B. Sc. MATHEMATICS 2016-17**

**PAPER-II**  
**CALCULUS**

**Duration: 3 Hours**

**Max. Marks: 75**

**UNIT-I**

Polar coordinates and derivatives of arc, polar subtangent and subnormal, pedal-equation, Roll's Theorem, Mean Value Theorems, Taylor's Theorem, their proofs, verifications and applications.

**UNIT -II**

Asymptotes, curvature, Test of concavity and convexity. Points of inflexion. Multiple points. Tracing of curves in Cartesian and polar coordinates.

**UNIT – III**

Beta Gamma functions and their properties. Quadrature, Rectification.

**UNIT - IV**

Degree and order of a differential equation. Equations of first order and first degree, Equations in which the variables are separable, Homogeneous equations. Linear equations and equations reducible to the linear form. Exact differential equations.

**UNIT - V**

First order and higher degree equations solvable for  $x, y, p$ . Clairaut's form and singular solutions. Geometrical meaning of a differential equation. Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations and the equations reducible in homogeneous form.

**References:**

1. Gorakh Prasad : A Text book on differential calculus (Pothi shala)
2. Gorakh Prasad : A Text book on Integral calculus and Differential Equations (Pothi shala).
3. E. A. Codignton : An introduction to ordinary Differential Equations Prentice Hall of India, 1961.
4. P.K. Jain and S. K. Kaushik : An Introduction to Real Analysis, S. Chand & Co., New Delhi-11, 2000.
5. Bansal, Bhargava : Avakalan Ganita-II
6. Bansal, Bhargava : Samakalan Ganita-II
7. Gokhroo, Saini : Uchch Avakalan Ganita.
8. Gokhroo, Saini : Uchch Samakalan Ganita.
9. Bansal, Bhargava & Agrawal : Avkal Samikaran I .
10. Gokhroo, Saini, Kumbhat : Avkal Samikaran.