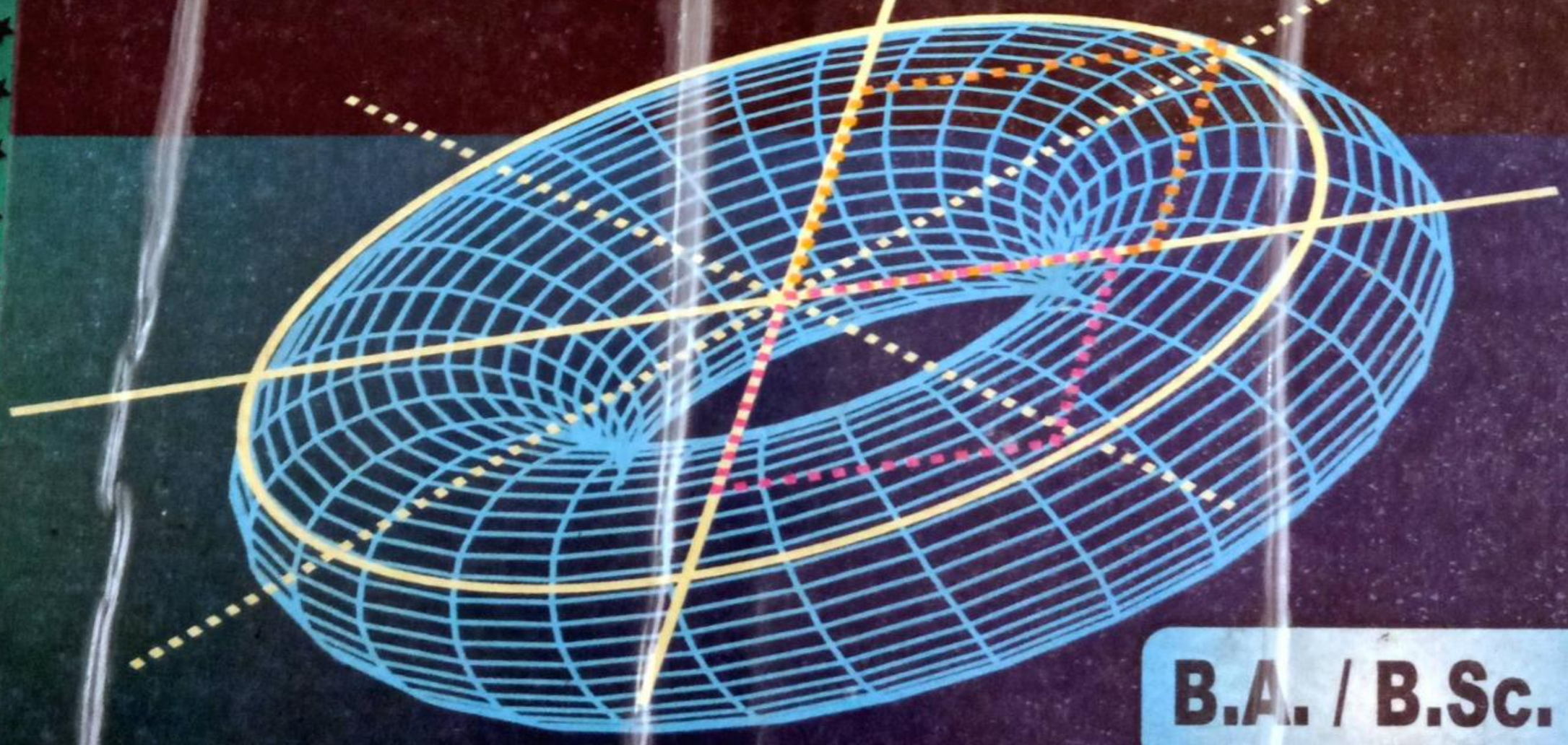
New College

ORDINARY DIFFERENTIAL EQUATIONS



B.A. / B.Sc. I

JEEVANSONS PUBLICATIONS

SYLLABUS

B. Sc. 1st Year

SECOND SEMESTER

ORDINARY DIFFERENTIAL EQUATIONS : (BM - 122)

Kurukshetra University, Kurukshetra

Maximum Marks : 50 *Time Allowed* : 3 Hou

Section - I

Geometrical meaning of a differential equation. Exact differential equations, integratin factors. First order higher degree equations solvable for x, y, p. Lagrange's equations, Clairaut equations. Equations reducible to Clairaut's form. Singular solutions.

Section - II

Orthogonal trajectories in Cartesian coordinates and polar coordinates. Self orthogon family of curves. Linear differential equations with constant coefficients. Homogeneous linea ordinary differential equations. Equations reducible to homogeneous.

Section - III

Linear differential equations of second order. Reduction to normal form. Transformatio of the equation by changing the dependent variable / independent variable. Solution by operato of non-homogeneous linear differential equations. Reduction of order of a differential equatio Method of variations of parameters. Method of undetermined coefficients.

Section - IV

Ordinary simultaneous differential equations. Solution of simultaneous differenti equations involving operators $x\,(d/dx)$ or $t\,(d/dt)$ etc. Simultaneous equation of the for $dx/P = dy/Q = dz/R$. Total differential equations. Condition for $Pdx + Qdy + Rdz = 0$ to be exac General method of solving $Pdx + Qdy + Rdz = 0$ by taking one variable constant. Method auxiliary equations.

Note. *The examiner is requested to set* ***nine questions*** *in all, selecting two question from each section and* ***one compulsory question*** *consisting of five part distributed over all the four sections. Candidates are required to attempt fiv questions, selecting at least one question from each section and the compulsor question.*

SYLLABUS

B. Sc. 1st Year

SECOND SEMESTER

ORDINARY DIFFERENTIAL EQUATIONS : (BM - 122)

Maharishi Dayanand University, Rohtak

Maximum Marks : 45 *Time Allowed* : 3 Hours

Section - I (3 Questions)

Geometrical meaning of a differential equation. Exact first order differential equations. First order higher degree equations solvable for x, y, p. Clairaut's equation and singular solutions. Orthogonal trajectories in Cartesian coordinates and Polar coordinates.

Section - II (2 Questions)

Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations. Equations reducible to homogeneous linear ordinary differential equations.

Section - III (3 Questions)

Linear differential equations of second order, Transformation of the equation by changing – the dependent variable / the independent variable. Methods of variation of parameters and unknown coefficients. Ordinary simultaneous differential equations. Total differential equations. Condition for $Pdx + Qdy + Rdz = 0$ to be exact. General method of solving $Pdx + Qdy + Rdz = 0$ by taking one variable constant.

Note. *The examiner is requested to set* ***eight questions*** *in all, selecting questions sectionwise as indicated in the syllabus. The candidate is required to attempt five questions selecting at least one question from each section.*

SYLLABUS

B. A. 1st Year
PAPER II

Maharishi Dayanand University & Kurukshetra University

CALCULUS & DIFFERENTIAL EQUATIONS

Section - I (3 Questions)

ε–δ definition of the limit of a function. Basic properties of limits. Continuous functions and classification of discontinuities. Differentiability. Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions. Asymptotes. Curvature. Tests for concavity and convexity. Points of inflexion. Multiple points. Tracing of curves in Cartesian and polar coordinates.

Section - II (3 Questions)

Reduction formulae. Quadrature. Rectification. Volumes and surfaces of solids of revolution.

Section - III (3 Questions)

Exact differential equations. First order higher degree equations solvable for x, y, p. Clairaut's form and singular solutions. Geometrical meaning of differential equations. Orthogonal trajectories. Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations. Total differential equations.

Section - IV (2 Questions)

Linear differential equations of second order. Transformation of the equation by changing - the dependent variable/the independent variable, reduction of order. Methods of variation of parameters and unknown coefficients. Ordinary simultaneous differential equations.

Note : *The examiner is requested to set **ten questions** in all selecting questions sectionwise as indicated in the syllabus. The candidate is required to attempt five questions selecting atleast one question from each section.*

N.B. ***The present book covers Section III and IV of the above syllabus for B.A. 1st Year students. Section I and II are covered in the book*** **New College Calculus** ***which is available separately.***

CONTENTS

Note For B.A. Students :

*The above chapters constitute Section III and Section IV of the Syllabus. For Section I and II, a separate book titled '**New College Calculus**' is available separately.*