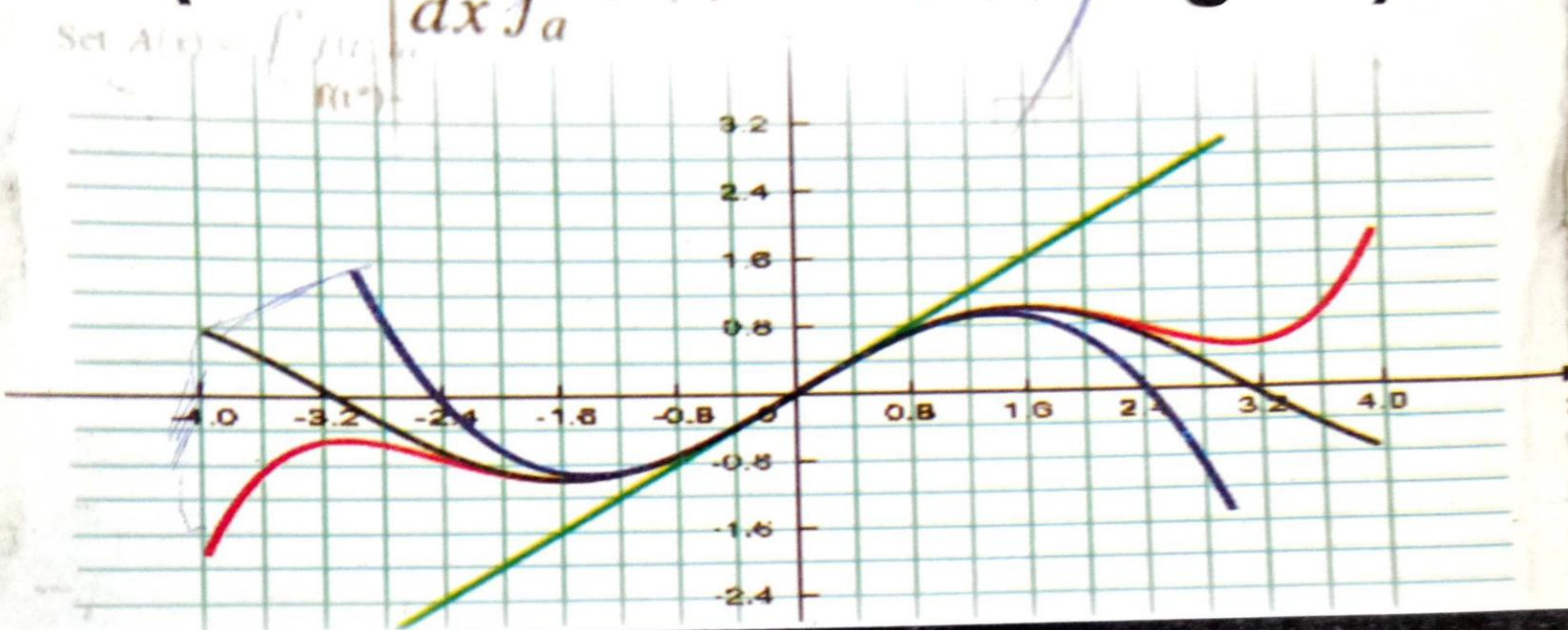


New College

Calculus

(Differential and Integral)



B.A. / B.Sc. I

JEEVANSONS PUBLICATIONS

SYLLABUS

B. Sc. 1st Year

FIRST SEMESTER

CALCULUS : (BM - 112)

Kurukshetra University, Kurukshetra

Maximum Marks : 50

Time Allowed : 3 Hours

Section - I

$\epsilon - \delta$ 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.

Section - II

Asymptotes in Cartesian coordinates, intersection of curve and its asymptotes, asymptotes in polar coordinates. Curvature, radius of curvature for Cartesian curves, parametric curves, polar curves. Newton's method. Radius of curvature for pedal curves. Tangential polar equations. Centre of curvature. Circle of curvature. Chord of curvature, evolutes. Tests for concavity and convexity. Points of inflexion. Multiple points. Cusps, nodes & conjugate points. Type of cusps.

Section - III

Tracing of curves in Cartesian, parametric and polar co-ordinates. Reduction formulae. Rectification, intrinsic equations of curve.

Section - IV

Quadrature (area) Sectorial area. Area bounded by closed curves. Volumes and Surfaces of solids of revolution. Theorems of Pappu's and Guilden.

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

SYLLABUS

B. Sc. 1st Year

FIRST SEMESTER

Differential and Integral Calculus : (BM - 112)

Maharishi Dayanand University, Rohtak

Maximum Marks : 45

Time Allowed : 3 Hours

Section - I (3 Questions)

$\epsilon - \delta$ 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 in Cartesian and polar coordinates. Curvature. Radius of curvature for Cartesian curves. Parametric curves. Polar curves and pedal curves. Newton's method. Tangential polar equations. Centre of curvature. Chord of curvature. Evolutes.

Section - II (2 Questions)

Tests for concavity and convexity. Points of inflexion. Multiple points. Nodes, Cusps & conjugate points. Type of cusps. Tracing of curves in Cartesian, parametric and polar coordinates. Reduction formulae.

Section - III (3 Questions)

Rectification of curves represented in Cartesian, parametric and polar form. Intrinsic equation. Quadrature. Volumes and Surfaces of solids of revolution.

Note. *The examiner is requested to set **eight questions** in all, selecting questions section wise 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 I and II of the above syllabus for B.A. 1st Year students. Section III and IV are covered in the book New College Ordinary Differential Equations which is available separately.*

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Note For B.A. Students :

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