MA103 Mathematics-I (3-1-0) Credits:4
Theory: 100
Sessional:50
Time: 3 hours

Unit I: Differential Calculus: **30 Marks**

Successive derivatives, Leibniz's theorem, tangent and normal, derivative of arc length (Cartesian & Polar), Tailor's Series and Maclaurin's Series, expansion of functions, Asymptotes, curvature, curve tracing, Functions of two or more variables, Partial derivatives, Homogeneous function (Definition)

Unit II: Integral Calculus: **30 Marks**

Reduction formulae for indefinite integrals involving power of circular functions of x and Product of $\text{Sin}^m x \text{ Cos}^n x$; Deduction of

$$\int_0^{\pi/2} \sin^n x dx \; ; \quad \int_0^{\pi/2} \cos^n x dx \; ; \quad \int_0^{\pi/2} \sin^n x \cos^n x dx$$

Length of plane curves (Cartesian & Polar), Areas under Plane curves (Cartesian & Polar), Volume and surface area of solids of revolution of plane curves.

Unit III Differential equations: **28 Marks**

Solution of ordinary first order and first degree differential equation of the following forms: Homogeneous, reducible to homogeneous, Linear, reducible to linear, Exact, reducible to exact. ODE of 1^{st} order but not of first degree, higher order linear equation with constant coefficients, Cauchy's homogeneous linear equation, simultaneous linear equations with constant Co-efficient.

Unit IV Vector algebra: **12 Marks**

Triple product of vector and their applications.

Texts/ references:

1.	Differential Calculus	B.C. Das & B.N. Mukhejee
2.	Integral Calculus Ltd B.	B. C. Das & U. N Dhar & Sons Pvt
3.	Calculus	James Stewart: Thomson books
4.	A Text book of Vector algebra	Shanti Narayan: S. Chand & CO.
5.	A text book of Engineering Maths	N.P Bali, Dr. N. Ch. Narayan Iyenger