

**MATHEMATICS (Subsidiary)****Paper II****(Calculus and Analytical Geometry)**

Time - 3 hours

Full Marks - 100

Twelve questions to be set. Six to be answered selecting at least one from each group.

**Group A****Differential Calculus (Three questions)**

Leibnitz theorem, Taylor's series and Maclaurin's series, Partial derivatives, Euler's theorem, Equation of Tangents and Normals, Asymptotes, Formulae of radius of curvature in different co-ordinate system, Maxima and minima of functions of single variable.

**Group B****Integral Calculus (Three questions)**

Integration of summation method, Reduction formula, Rectification and quadrature with simple examples, Surface and volume of solids of revolution, Moment of inertia, Simple use of double and triple integration and Gamma and Beta functions.

**Group C****Differential Equations (Three questions)**

Degree and order of differential equations, Equations of first order and first degree, Separation of variables, Homogeneous equations, Linear equations and reducible to linear form, Exact differential equations, First order higher degree differential equations, Solvable for  $x$ ,  $y$ ,  $p$ , Clairaut's form, Linear differential equations of second order with constant co-efficients, Orthogonal trajectories.

**Group D****Vector Analysis and Mechanics (Three questions)**

Classification of Vectors, Triple products, Differentiation of vector functions, Differentiation of a product of two vectors, Gradient of a scalar, Divergence and curl of a vector in Cartesian co-ordinate.

**Books Recommended**

1. Differential Calculus by Das Gupta
2. Differential Calculus by Shanti Narayan
3. Differential Calculus by Laljee Prasad
4. Integral Calculus by Shanti Narayan
5. Integral Calculus by A. Das Gupta
6. Integral Calculus by Laljee Prasad
7. Vector Analysis by Laljee Prasad
8. Vector Analysis by Das Gupta