

MATHEMATICS (GENERAL)**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)**

Successive differentiation, Leibnitz theorem, Statement of Taylor's series and Maclaurin's series, Expansion using them, Partial derivatives, Euler's theorem, Exact differential, Tangents and Normals, Sub-tangent, Sub-normal, Polar sub-tangent, Polar sub-normal, Intrinsic and Pedal equations, Curvature, Asymptotes.

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

Integration of rational functions, Definite integral as limit of a sum, Reduction formula, Rectification and quadrature, Surface and volume of solids of revolution, Moment of inertia, Centre of gravity.

Group C**Analytical Geometry of two dimension(Three questions)**

System of circles, Coaxial circles, Change of axis, Standard equations of parabola, ellipse and hyperbola, Condition for the general equation of the second degree to represent parabola, ellipse and hyperbola and reduction into standard form, Equations of tangent and normal in case of general equations (using Calculus) and their forms in case of particular conic section.

Analytical Geometry of three dimensions (Three questions)

Rectangular, Spherical, Polar and Cylindrical co-ordinates, Direction cosines, Angle between straight lines, Equations of planes and straight lines, shortest distance between lines, Coplaner lines, Equations of sphere and cylinder.

Books Recommended

1. Differential Calculus by **Das Gupta**
2. Integral Calculus by **Das and Mukherjee**
3. Analytical Geometry of two dimensions by **S. L. Loney**
4. Analytical Geometry of three dimensions by **Shanti Narayan**
5. Differential Calculus by **J. Edwards**
6. Differential Calculus by **Laljee Prasad**
7. Integral Calculus by **Benjamin Williamson**
8. Integral Calculus by **Laljee Prasad**
9. Analytical Geometry of two dimensions by **E. H. ASKWITH**
10. Analytical Geometry of three dimensions by **J. T. Bell**