Ramakrishna Mission vidyamandira
Belur Math: Howarah
Syllabus for B.Sc. (Hons) Mathematics Admission Entrance Test 2022

Algebra:

Law of indices, A.P., G.P., H.P., Logarithms, Complex Numbers, Quadratic Equations, Permutation and combination, Principle of mathematical induction, Binomial theorem (positive integral index), Matrices, Determinant, Sequence and Series.

Sets, Relations and Mapping, Statistics and Probability

Trigonometry: trigonometric functions, addition and subtraction formulae, formulae involving multiple and submultiple angles, general solution of trigonometric equations. Properties of triangles, inverse trigonometric functions and their properties.

Coordinate geometry:

2D:

Distance formula, section formula, area of a triangle, condition of collinearity of three points in a plane. Polar co-ordinates, transformation from Cartesian to polar coordinates and vice versa. Parallel transformation of axes, Concept of locus, locus problems involving all geometrical configurations,, Straight line, Circle, conic section, parabola, ellipse, hyperbola.

3D:

Direction cosines and direction ratios, distance between two points and section formula, equation of a straight line, equation of a plane, distance of a point from a plane.

Calculus:

Differential Calculus: Functions, Limit, Continuity, Differentiation.

Integral Calculus: Integration as a reverse process of differentiation, indefinite integral of standard functions. Integration by parts. Integration by substitution and partial fraction.

Definite integral as a limit of a sum with equal subdivisions. Fundamental theorem of integral calculus and its applications. Properties of definite integrals.

Differential Equations: Formation of ordinary differential equations, solution of homogeneous differential equations, separation of variables method, linear first order differential equations.

Application of Calculus: Tangents and normals, conditions of tangency. Determination of monotonicity, maxima and minima. Differential coefficient as a measure of rate. Motion in a straight line with constant acceleration. Geometric interpretation of definite integral as area, calculation of area bounded by elementary curves and Straight lines. Area of the region included between two elementary curves.

Vectors: Addition of vectors, scalar multiplication, dot and cross products, scalar triple product