Syllabus for FYUG Entrance Examination
Paper II - Mathematics

Sets, Relations and Functions

Sets and their representations, Types of sets, Operations on sets, Cartesian product on sets, Relations, Equivalence relations and partitions, Functions, Operations on functions, Types of functions, Use of functions to compare size.

Trigonometric Functions

Angles, Trigonometric Functions, Trigonometric Functions of Sum and Difference of Two Angles, Trigonometric Equations, Inverse Trigonometric Functions and its properties, Application of trigonometric functions.

Matrices and Determinants

Matrices, Types of matrices, Matrix addition and matrix multiplication and their properties, Transpose of a matrix, Symmetric and Skew symmetric matrices, Determinants and its properties, Adjoint and Inverse of a matrix, Cramer's rule.

Complex Numbers and Quadratic Equations

Complex Numbers, Algebra of Complex Numbers, The Modulus and the Conjugate of a Complex Number, Argand Plane and Polar Representation, Quadratic Equations.

Permutations, Combinations and Binomial Theorem

Fundamental Principle of Counting, Permutations, Combinations, Binomial Theorem for Positive Integral Indices, General and Middle Terms in Binomial Expansions.

Sequences and Series

Sequences, Series, Arithmetic Progression (A.P.), Geometric Progression (G.P.), Relationship Between A.M. and G.M.

Straight Lines

Slope of a Line, Various Forms of the Equation of a Line, General Equation of a Line, Distance of a Point From a Line, Pair of straight lines.

Conic Sections and Three Dimensional Geometry

Sections of a Cone, Circle, Parabola, Ellipse, Hyperbola, Coordinate Axes and Coordinate Planes in Three Dimensional Space, Coordinates of a Point in Space, Distance between Two Points, Section Formula, Direction cosines and direction ratios of a line, Equation of a line in space, Angle between two lines, Shortest distance between two lines, Plane, Coplanarity of Two Lines, Angle between two planes, Distance of a point from a plane, Angle between a line and a plane.

Vector Algebra

Types of vectors, Addition of vectors, Properties of vector addition, Multiplication of a vector by a scalar, Product of two vectors, Vector product of two vectors.

Limits, Continuity and Differentiability

Limits, Limits of Trigonometric Functions, Derivatives, Continuity, Differentiability, Logarithmic Differentiation, Derivatives of Functions in Parametric Forms, Second order Derivative, Mean Value Theorem.

Applications of Derivatives

Rate of change of quantities, Increasing and Decreasing Functions, Tangents and Normals, Approximations, Maxima and Minima.

Integration

Integration as an Inverse Process of Differentiation, Methods of Integration, Integration by Partial Fractions, Integration by Parts, Definite Integral, Fundamental Theorem of Calculus, Evaluation of Definite integrals by Substitution, Properties of Definite Integrals.

Application of integrals and Differential Equations

Area under simple curves, Area between two curves, General and particular solutions of a Differential Equation, Formation of Differential Equation whose general solution is given, Methods of solving first order, first degree differential equations.

Statistics and Probability

Measures of central tendency, Measures of Dispersion, Range, Mean Deviation, Variance and Standard Deviation, Random Experiments, Events, Probability, Conditional probability, Multiplication theorem on probability, Independent events.