St. Xavier's College, Ranchi
An Autonomous College of Ranchi University
Entrance Test Syllabus 2025

Syllabus	Description
Course	B.Sc. Mathematics Honours
No of Seat	80
Question Pattern	50 multiple choice type question to be answered by the candidate. The multiple choice questions should be answered on OMR sheet by darkening the appropriate circle with blue/black ball point pen only. 3 marks will be given for correct answer and 1 mark will be deducted for Wrong answer. Full marks- 150
Time	2 hours
Topic to be Covered	**All question from CBSE/JAC+2 level.** **Set theory, Relation and function** **Algebra** Linear inequality. Algebra of complex numbers, addition, multiplication, conjugation,polar representation. Quadratic equations with real coefficients, relations between roots and coefficients. Arithmetic, geometric and harmonic progressions, sums of squares and cubes of the first n natural numbers and related problems. Logarithms and their properties. Permutations and combinations, Binomial theorem for a positive integral index, properties of binomial coefficients. Matrices and Determinant **Statistics and probability.** **Trigonometry** Trigonometric functions, their periodicity and graphs, addition and subtraction formulae, formulae involving multiple and sub-multiple angles, general solution of trigonometric equations. Relations between sides and angles of a triangle, sine rule, cosine rule, half-angle formula and the area of a triangle, inverse trigonometric

	functions. **Analytical geometry** **Two dimensions**: Straight line, Circle, Parabola, ellipse, hyperbola. **Three dimensions**: Direction cosines and direction ratios, equation of a straight line in space, equation of aplane, distance of a point from a plane. **Differential calculus** Limit and continuity of a function, Differentiability, Derivative of a different functions,geometricalinterpretationofthederivative,tangentsandnormals, increasing and decreasing functions, maximum and minimum values of a function, applications of Rolle's Theorem and Lagrange's Mean Value Theorem. **Integral calculus** Integration as the inverse process of differentiation, in definite integrals of standard functions, definite integrals and their properties. **Application of integration** Application of definite integrals to the determination of areas involving simple curves. Formation of ordinary differential equations, solution of homogeneous differential equations, variables separable method, linear first order differential equations. **Vectors** Addition of vectors, scalar multiplication, scalar products, dot and cross products, scalar triple products and their geometrical interpretations.
Venue	St. Xavier's College, Ranchi
Remarks	For details (date & time of entrance test, merit list, waiting list etc.) Visit college website.