ISI Admission Test 2026

Syllabus for M. Math. Programme

Test Codes: PMA (Forenoon) and PMB (Afternoon)

1. **Analysis**

   - Countable and uncountable sets;
   - Equivalence relations and partitions;
   - Convergence and divergence of sequences and series;
   - Cauchy sequence and completeness;
   - Bolzano–Weierstrass theorem;
   - Continuity, uniform continuity, differentiability, Taylor expansion;
   - Differentiation of functions from $\mathbb{R}$ to $\mathbb{R}^n$;
   - Partial and directional derivatives, Jacobians;
   - Sequences and series of functions, Weierstrass approximation theorem;
   - Elements of ordinary differential equations, linear differential equations;
   - Integral calculus of one variable–existence of Riemann integral;
   - Fundamental theorem of calculus, change of variable, improper integrals.

2. **Metric spaces**

   - Open, closed and compact sets;
   - Continuous functions;
   - Completeness, connectedness and path connectedness.

3. **Linear algebra**

   - Vector spaces, subspaces, basis, dimension, direct sum;
   - Matrices, systems of linear equations, determinants;
   - Linear transformations and their representation as matrices;
   - Dual space of a vector space; transpose of a linear transformation;
   - Eigenvalues and eigenvectors, diagonalization, triangular forms;
   - Inner product spaces; adjoint of a linear transformation.

4. **Abstract algebra**

   - Groups, subgroups, quotient groups, homomorphisms, products;
   - Lagrange's theorem, Sylow's theorems;
   - Rings, ideals, maximal ideals, prime ideals, quotient rings;
   - Integral domains, Chinese remainder theorem, polynomial rings, fields.