SYLLABUS FOR MULIPLE CHOICE QUESTIONS
TEST CODE: MMA

Algebra: Arithmetic, Geometric and Harmonic Progression. Continued fractions. Permutations and Combinations. Binomial theorem. Basic inequalities such as AM-GM and Cauchy-Schwarz. Complex numbers, de Moivre's theorem. Polynomials and their roots, remainder theorem, factor theorem.

Elementary set theory, relations, functions, binary operations. Basic properties of a group: subgroups, Abelian groups, cyclic groups, normal subgroups, homomorphism, isomorphism, permutation groups, cosets and Lagrange's theorem.

Vector spaces: subspaces, linear independence, span, basis, dimension. Linear transformations: null space, nullity, range, rank. Matrices: determinant, rank and inverse, system of linear equations, eigenvalues and eigenvectors.

Elementary number theory: divisibility, congruence, primality.

Geometry and trigonometry: Plane geometry, straight line, circle, parabola, ellipse, hyperbola, trigonometric functions and identities.

Calculus: Sequence and limit. Limit and continuity of functions of one variable. Differentiation and integration of functions of one variable with applications. Rolle's theorem and mean value theorem. Maxima and minima. Series: power series, Taylor series and Maclaurin series. Definite integrals. Functions of several variables: limit, continuity, differentiability. Double integrals and their applications. Ordinary linear differential equations.

Elementary discrete probability theory: Combinatorial probability, conditional probability, indepedence, Bayes' theorem and applications.