Test Codes: UGA (Multiple-choice Type) and
UGB (Short Answer Type) **2022**

Questions will be set on the following and related topics.

Algebra: Sets, operations on sets. Prime numbers, factorization of integers and divisibility. Rational and irrational numbers. Permutations and combinations, basic probability. Binomial Theorem. Logarithms. Polynomials: Remainder Theorem, Theory of quadratic equations and expressions, relations between roots and coefficients. Arithmetic and geometric progressions. Inequalities involving arithmetic, geometric and harmonic means. Complex numbers. Matrices and determinants.

Geometry: Plane geometry. Geometry of 2 dimensions with Cartesian and polar coordinates. Equation of a line, angle between two lines, distance from a point to a line. Concept of a Locus. Area of a triangle. Equations of circle, parabola, ellipse and hyperbola and equations of their tangents and normals. Mensuration.

Trigonometry: Measures of angles. Trigonometric and inverse trigonometric functions. Trigonometric identities including addition formulae, solutions of trigonometric equations. Properties of triangles. Heights and distances.

Calculus: Sequences - bounded sequences, monotone sequences, limit of a sequence. Functions, one-one functions, onto functions. Limits and continuity. Derivatives and methods of differentiation. Slope of a curve. Tangents and normals. Maxima and minima. Using calculus to sketch graphs of functions. Methods of integration, definite and indefinite integrals, evaluation of area using integrals.