Mathematics.—A. (Elementary.) (Marks, 2,000.)

Arithmetic and Mensuration.—The ordinary rules of arithmetic. The metric system. Use of decimals in approximative calculation (contracted methods of calculation are not expected). Measurement of length : scale, vernier, calipers. Measurement of area by dimensions (rectilinear figures and circle), by squared paper, by weighing ; area of cross-section of a tube. Measurement of volume by dimensions, by displacement (overflow, graduated jar, burette), by use of the principle of Archimedes. Measurement of weight, use of balance. Measurement of density or specific gravity. (Algebraic formulæ and symbols may be used. Questions will not be set on present value or true discount. The extraction of the cube root, and the use and theory of recurring decimals, are not required.)

Geometry.—The elements of geometrical drawing and practical geometry. Measurement of angles, use of protractor. The substance of Books I to III of Euclid's Geometry, including application to the measurement of area. A working knowledge of as much of the properties of similar figures and solid figures as is necessary for plan-making and simple problems in mensuration.

Algebra.—To easy quadratic equations. The elementary use of graphs. (The solutions of equations should be worked out to a few significant figures ; the candidates should be accustomed to test the accuracy of solutions by substitution. Skill in elaborate analysis, such as the simplification of complicated fractions, will not be looked for. The questions in elementary mathematics will test knowledge of fundamental principles and readiness in application to simple practical problems. Neatness and accuracy of working are expected, and the methods of solution employed must be clearly indicated. In the absence of special instructions that a question is to be answered by a particular method, candidates are at liberty to choose their own method from any branch of mathematics.)

The examination in elementary mathematics will include a laboratory test.

Mathematics.—B. (Intermediate.) (Marks, 2,000.)

Includes Mathematics A (elementary), together with,—

Arithmetic.—Use of four-figure logarithms will be required ; use of slide-rule permitted.

Geometry.—Geometrical drawing and practical geometry of plane figures. The substance of Books I to IV, and VI of Euclid's Geometry. The elements of theoretical solid geometry with application to mensuration of solids. (Proportion may be treated algebraically, and the complications of Euclid's definition and nomenclature avoided. The special treatment of incommensurables will not be required.)

Algebra.—The meaning and the simplest properties of fractional and negative indices ; graphs of the simpler algebraic functions ; quadratic equations ; use of graphs in solving equations, and in illustrating and solving practical problems ; practical applications of gradients and of areas of graphs. (Grasp of elementary principles, and readiness in practical application, will be looked for, but great skill in analytical transformations will not be demanded.)

Trigonometry.—Solution of plane triangles ; graphs of trigonometrical functions ; use of four-figure tables ; formulæ for the trigonometrical ratios of the sum and difference of two angles, and for the product forms of the sum and difference of sines and cosines of two angles. (Readiness in straightforward practical applications will be looked for, but no great analytical skill will be demanded. A knowledge of the general expression for all angles which have a given sine or other trigonometrical ratio will not be required.)

Statics.—Graphical and analytical methods ; simple machines ; centre of gravity ; friction.

Dynamics.—Accelerated motion in a straight line treated graphically ; uniformly accelerated motion in a straight line ; composition of velocities and accelerations ; uniform circular motion; motion under gravity ; elementary illustrations and applications of dynamical principles. (In the absence of special instructions that a question is to be answered by a particular method, candidates are at liberty to choose their method from any branch of mathematics.)

The examination in intermediate mathematics will include a laboratory test.

Mathematics.—C. (Higher.) (Marks, 2,000.)

Includes elementary and intermediate mathematics, together with,—

Geometry.—Elements of solid geometrical drawing.

Algebra.—Elementary knowledge of the use of indeterminate co-efficients, especially with partial fractions.

Co-ordinate Geometry and Infinitesimal Calculus.—Equations to straight line, circle, ellipse, parabola, hyperbola, and other simple curves, in rectangular co-ordinates. (The curves referred to will provide illustrations and applications of co-ordinate geometry and infinitesimal calculus, but acquaintance is expected only with the simplest theorems about the curves.)

Differentiation and integration of simple standard forms and other forms depending on them ; application to easy geometrical properties of plane curves, to easy mechanical and physical problems, to turning values, and to the expansion of simple algebraic and trigonometric functions. A working knowledge (without rigorous fundamental demonstrations) of the elementary infinite series for $(1 + x)^m$, e^x, $\log (1 + x)$, and their use in approximative calculations.

Co-ordinate geometry of three dimensions up to the equations to the plane and the straight line.

Polar Co-ordinates—Deduction of the equation of a curve from simple data ; drawing a curve from its equation.

Mechanics.—Elementary statics of liquids and gases. Further mechanics of solid bodies— *e.g.*, pendulum, and easy questions on moment of inertia. (In higher mathematics more analytical skill will be expected than in the earlier stages. In the absence of special instruction that a question is to be answered by a particular method, candidates are at liberty to choose their method from any branch of mathematics.)

The examination in higher mathematics will include a laboratory test.