

A knowledge of the arithmetic and mensuration included in the programme of the Public Service Entrance Examination will be assumed. Tables of logarithms will be supplied.

(b.) Algebra: Definitions and explanations of algebraical signs and terms; addition, subtraction, multiplication, and division of algebraical quantities, including easy fractions and easy surds (the candidate will not be expected to show skill in the manipulation of complicated formulæ, but he may be required to ascertain accurately the numerical value of any quantity or expression given to him); square root; the elementary rules of ratio and proportion; easy equations of a degree not higher than the second, and questions producing such equations; easy arithmetical and geometrical series; graphs of simple algebraic functions within the limits of the foregoing work, and graphical methods of solving equations. Very easy permutations and combinations; binomial theorem (the candidate may be expected to explain the case in which the exponent is a positive integer, but a rigid proof will not be required); the use of approximate formulæ, such as $(1+x)^3 = 1+3x$, $(1-x)^{-\frac{1}{2}} = 1+\frac{1}{2}x$, when x is small compared with 1.

- (11.) *Geometry and Trigonometry*.—Every candidate must be provided with a ruler graduated in inches and tenths and in centimeters and millimeters, a small set-square, a protractor or scale of chords, compasses with pencil-point, and a fine pencil. Tables of logarithms will be supplied.

(a.) Geometry: Sections A and B (practical and theoretical geometry) as in the Civil Service Junior Examination, together with the following:—

SECTION C (PRACTICAL).

- To draw a normal to a plane from an external point.
- Projections of a point on three planes at right angles.
- Determination of a point by means of its co-ordinates (x, y, z), referred to three rectangular axes and by means of its polar co-ordinates.
- Projection of a straight line on a plane making a given angle with it.
- Projection of a plane figure on a plane making a given angle with it.
- Development of the right prism, and of the right pyramid.
- Determination of the surface, the base being a regular polygon, of the right prism and right pyramid.
- Volume of the prism and pyramid.
- The generation of the right circular cylinder, right circular cone, and sphere by revolution.
- Development of the right circular cylinder, and right circular cone; the surface of each.
- Volume of the cylinder, cone, and sphere.

SECTION D (THEORETICAL).

- The square on the side of a triangle is greater than, equal to, or less than the sum of the squares on the other two sides according as the angle contained by these sides is obtuse, right, or acute. The difference in the cases of inequality is twice the rectangle contained by one of the two sides and the projection on it of the other.
- If a straight line is drawn parallel to one side of a triangle, the other sides are divided proportionally; and the converse.
- If two triangles are equiangular, their corresponding sides are proportional; and the converse.
- If two triangles have one angle of the one equal to one angle of the other, and the sides about their equal angles proportional, the triangles are similar.
- The internal bisector of an angle of a triangle divides the opposite side internally in the ratio of the sides containing the angle, and likewise the external bisector externally.
- The ratio of the areas of similar triangles is equal to the ratio of the squares on corresponding sides.
- The ratio of the areas of similar polygons is equal to the ratio of the squares on corresponding sides.
- In equal circles (or in the same circle) the ratio of any two angles at the centre or of any two sectors is equal to the ratio of the arcs on which they stand.