

GEOMETRY

1966

100 Marks. Time—One hour and a half.

All questions to be answered.

1. Using ruler and compass only, construct :

(i) an angle 105° ;

(ii) an isosceles triangle on a base $2.4''$ and having the vertical angle twice as big as each of the base angles.

[16 marks.]

2. Draw geometrical figures to illustrate :

(i) $a^2 + b^2 = a(a-b) + b(a+b)$;

(ii) $a^2 - b^2 = a(a-b) + b(a-b)$.

Explain each figure.

[16 marks.]

3. (i) Show that the sum of the three angles of any triangle is equal to two right angles ;

(ii) Draw any triangle and inscribe a circle in it.

[17 marks.]

4. What do you understand by a symmetrical figure? Illustrate by diagrams the axes of symmetry in each of the following: (a) an equilateral triangle; (b) a rectangle; (c) a square.

Draw (i) a triangle, and (ii) a four-sided figure which are *not* symmetrical.

[17 marks.]

5. If a straight line cuts two parallel straight lines, show that the alternate angles are equal.

If the two pairs of interior angles on each side of the cutting line are bisected, show that the figure formed by the bisectors is a rectangle.

[17 marks.]

6. (i) AB and CD are equal chords in a circle. Show that they are equidistant from the centre of the circle.

(ii) AB is the diameter of a circle with centre O, and AC is a chord making the angle $BAC = 30^\circ$. Show that the triangle BOC is an equilateral triangle.

[17 marks.]