INTERMEDIATE CERTIFICATE EXAMINATION, 1989

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MECHANICAL DRAWING

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FRIDAY, 16 JUNE - AFTERNOON,   2.00 to 5.00

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400 marks

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INSTRUCTIONS

(a) Five questions to be answered;   one of these **must** be question No. 1, Section A.
    Two must be selected from Section B and **two** must be selected from Section C.
(b) All questions carry equal marks.
(c) The number of the question must be distinctly marked by the side of each question.
(d) Work on one side of the paper only.
(e) Examination number must be distinctly marked on each sheet of paper used.
(f) All construction lines must be clearly shown.
(g) All measurements are in millimetres.

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SECTION A

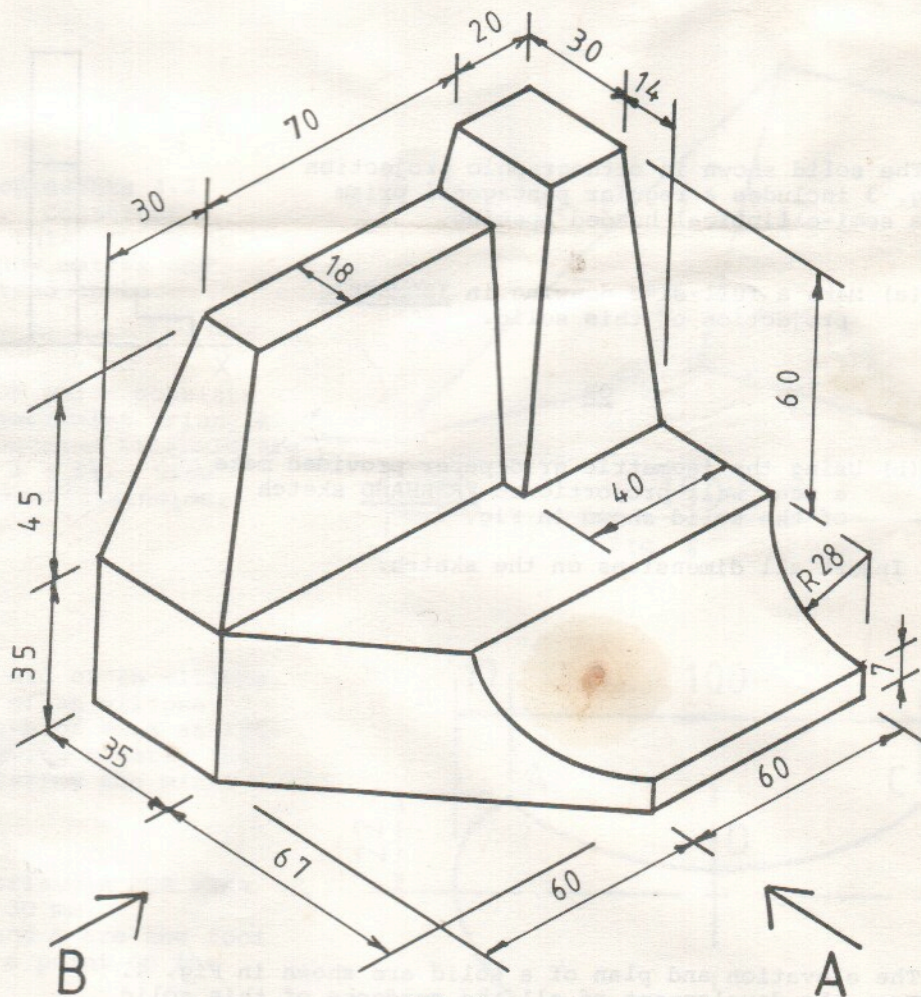(This question **must** be attempted)

FIG. 1

1. A shaped solid is shown in fig. 1. Make a full-size drawing of this solid in
orthographic projection showing:-

    (i) An elevation looking in the direction of arrow A.

   (ii) An end-view looking in the direction of arrow B.
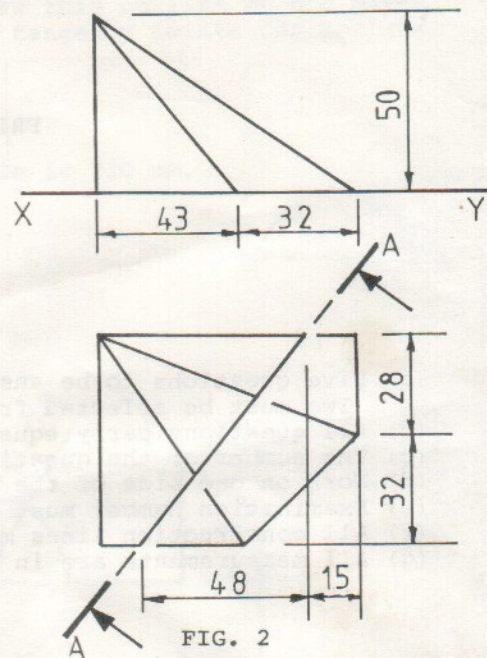
 (iii) A plan projected from (i) above.

(Two questions to be attempted from this Section.)

2. Fig. 2 shows the elevation and incomplete plan of a solid. The solid is cut by the plane A-A.

    (a) Draw the plan and elevation of the cut solid.

    (b) Project a sectional elevation of the cut solid
        when viewed in the direction of the arrows.
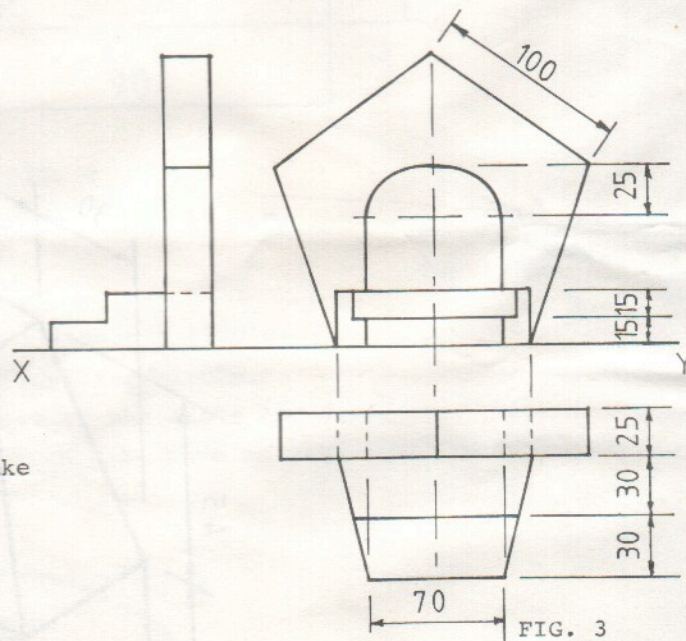
FIG. 2

3. The solid shown in orthographic projection in Fig. 3 includes a regular pentagonal prism with a semi-elliptical headed opening.

    (a) Make a full-size drawing in ISOMETRIC
        projection of this solid.

OR

    (b) Using the isometric grid-paper provided make
        a neat well-proportioned FREEHAND sketch
        of the solid shown in Fig. 3.

Insert all dimensions on the sketch.

FIG. 3

4. The elevation and plan of a solid are shown in Fig. 4.
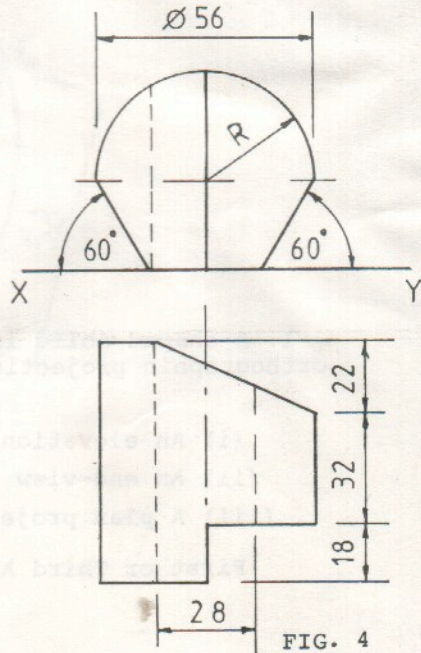   Draw the development of all the surfaces of this solid.

FIG. 4

5. Fig. 5 shows the plan of a cylinder A having a height of 70 mm and a cone B having a height of 55 mm resting on the horizontal plane. A sphere of diameter 40 mm is placed on the horizontal plane in position C so that it is in contact with cylinder A and cone B.

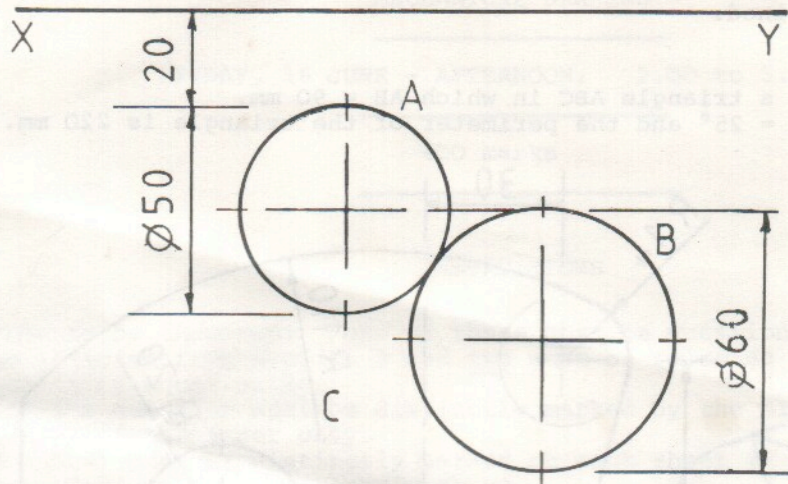   Draw the plan and elevation of these solids in the given position.

FIG. 5

SECTION C

(Two questions to be attempted from this section)

6. (a) A length of 117 mm represents 4.2 metres on a drawing. Construct a diagonal scale to this representation to show metres and centimetres and to read up to 6 metres.

   (b) Fig. 6 shows a diagram which consists of a square and an isosceles triangle. The sides of the isosceles triangle are in the ratio of 1 : 1 : 1¾. Draw the figure to the given dimension.
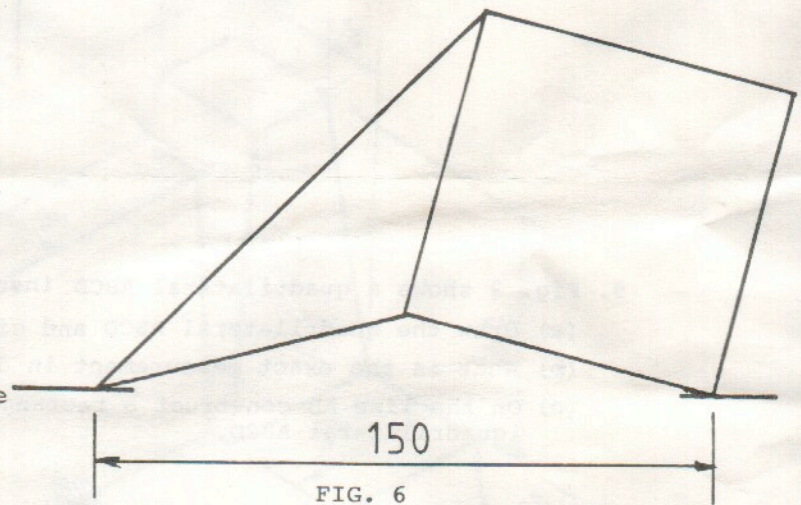
FIG. 6

7. (a) Fig. 7 shows portion ABC of an ellipse. ADC is also portion of an ellipse having the same length of axes as ABC. Draw the outline showing clearly the construction for locating the minor axis.

   (b) Draw a right-angled triangle PQR when PQ = 80 mm and PR = 30 mm. In this triangle P and Q are the foci of an ellipse and R a point on the curve.

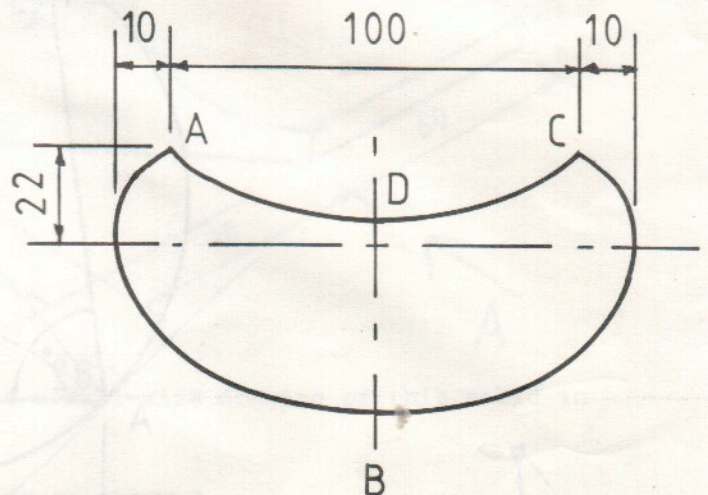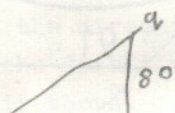   Find the major and minor axes and draw half of the curve which will pass through R.

FIG. 7

OVER→

8. (a) The outline of a design is shown in fig. 8. Draw this outline to the given
       dimensions showing clearly how the centres and tangency points for the arcs
       are obtained.

   (b) Construct a triangle ABC in which AB = 90 mm,
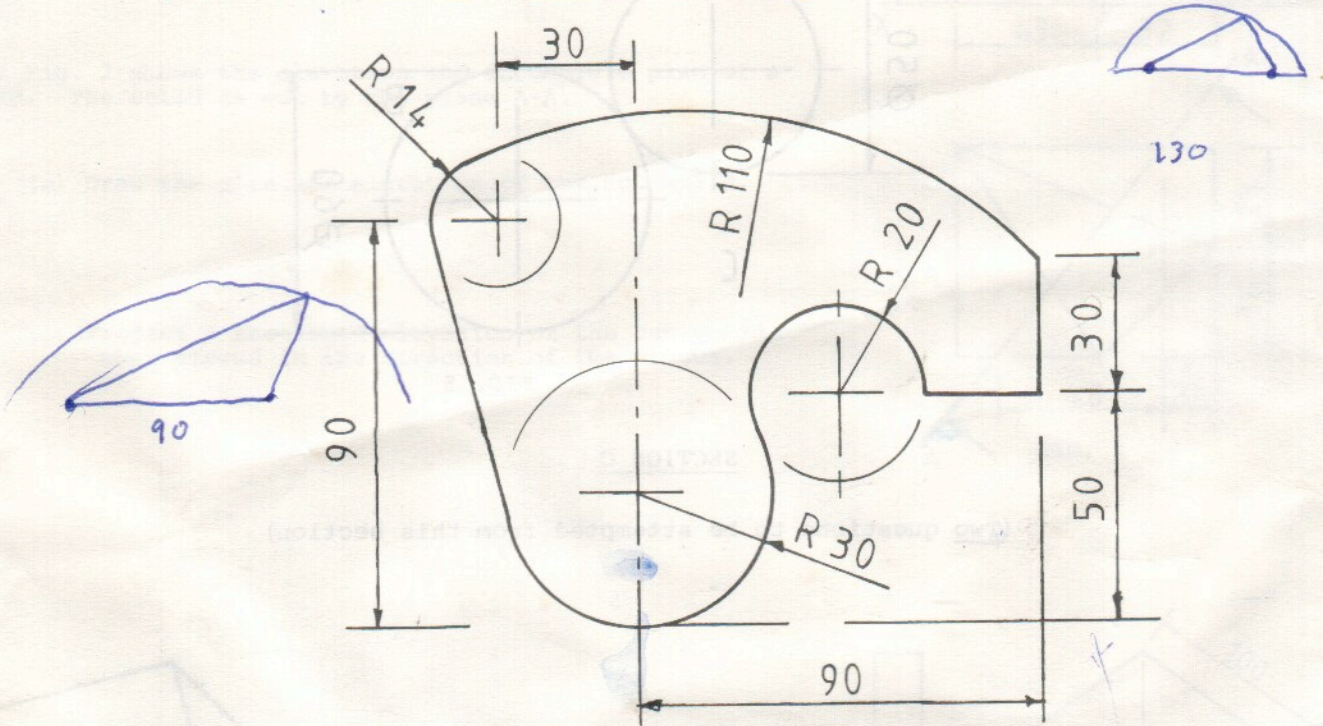   angle BAC = 25° and the perimeter of the triangle is 220 mm.

FIG. 8

9. Fig. 9 shows a quadrilateral ABCD inscribed within a circle.

   (a) Draw the quadrilateral ABCD and circumscribing circle.

   (b) What is the exact measurement in degrees of the angle ADC ?

   (c) On the line AD construct a rectangle which will have an area equal to
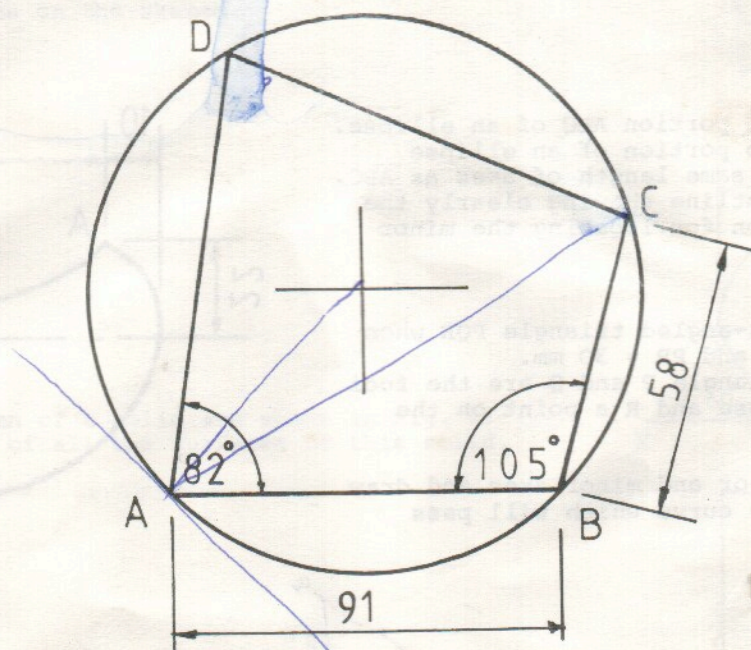   quadrilateral ABCD.

FIG. 9