TECHNICAL DRAWING - ORDINARY LEVEL - PAPER I
(Plane and Solid Geometry)

WEDNESDAY, 20 JUNE - AFTERNOON 2.00 - 5.00

200 marks

INSTRUCTIONS

(a) Answer <u>four</u> questions.
(b) All questions carry equal marks.
(c) Construction lines must be shown on all solutions.
(d) Write the number of the question distinctly on the answer paper.
(e) All dimensions on the question paper are given in millimetres.
(f) First or third angle projection may be used.

1. Fig. 1 shows the elevation and
    incomplete plan of a cut solid.
    The base of the solid is an
    equilateral triangle.
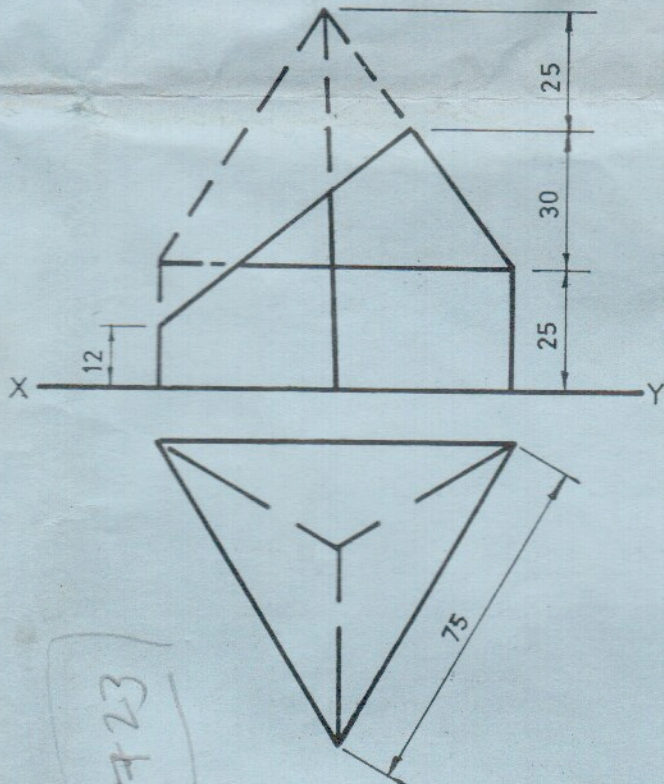
    (i)   Draw the elevation and
          complete the plan of
          the cut solid.

    (ii) Project an end-view of
          the cut solid.

    (iii) Project a new plan of
          the cut solid which shall
          include the true shape
          of the cut surface.

FIG. 1

OVER→

2. (a) Draw a triangle ABC in which
        the side AB = 70 mm, angle
        BAC = 50° and the perimeter
        is 220 mm.

   (b) In the irregular pentagon
        DEFGH shown in Fig. 2 the
        triangle FGH is similar
        to triangle ABC in (a) above.
        Draw the pentagon DEFGH.

   (c) Draw a square which will
        have 1.75 times the area
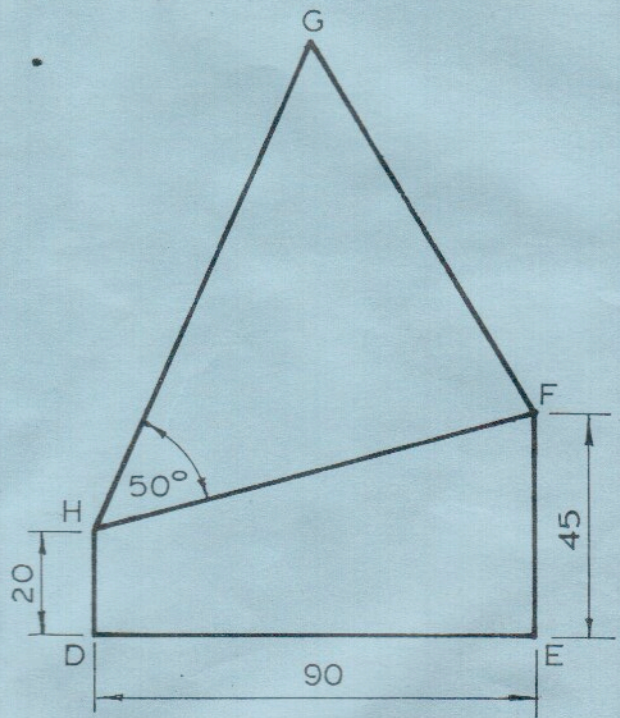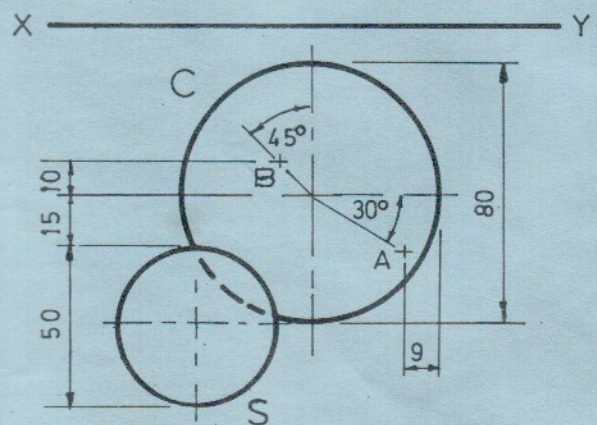   of the pentagon DEFGH.

FIG. 2

3. Fig. 3 shows the plan of
   a right cone C in contact
   with a sphere S. The
   altitude of the cone is
   60 mm. Both solids rest
   on the horizontal plane.

   (a) Draw the two solids
        in plan and elevation
        showing the point of
        contact in both views.

   (b) A and B are two points
        on the surface of the
        cone C. Locate A and B
        in the elevation. Draw
        the projections of the
        shortest line on the
        surface of the cone
        from A to B.

FIG. 3

4. (a) A circle has a diameter of 36 mm. Starting at any point on the circumference draw the involute to this circle.

(b) Fig. 4 shows a circle passing through the point P and tangential to the line AB at Q.

(i) Draw the figure showing clearly how to find the centre for the circle.

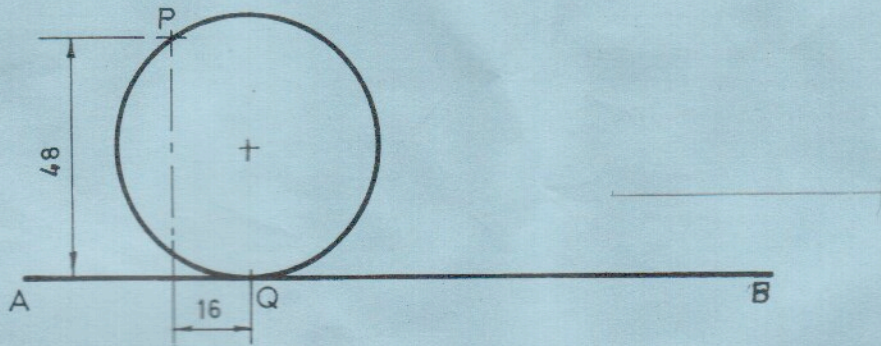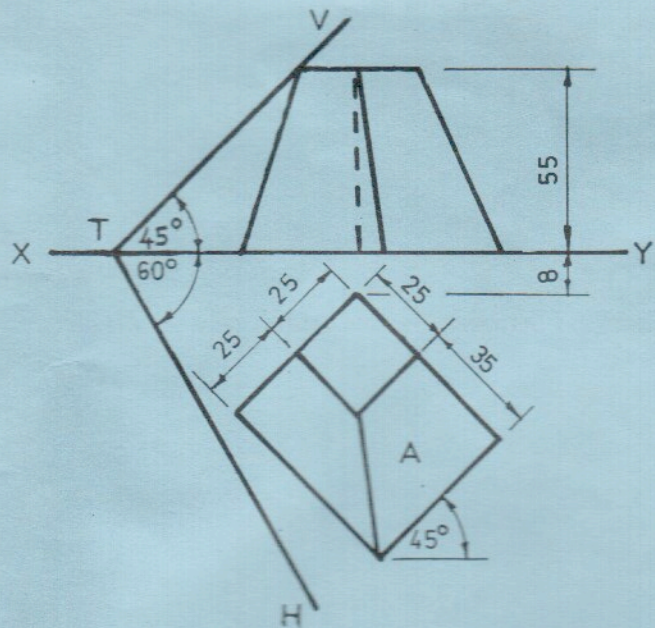(ii) Draw the locus of the point P on the circle as the circle rolls along the line AB for one complete revolution.

FIG. 4

5. The elevation and plan of a solid which is to be cut by the oblique plane VTH are given in Fig. 5.

(a) Draw the elevation and plan of the solid when it is cut by the plane VTH.

(b) Draw the horizontal and vertical traces of the plane which contains surface A of the solid.

FIG. 5

OVER→

6. (a) The focus of a parabola
is 50 mm from the directrix.
Draw the curve and construct
the tangent at a point P on
the curve which is 40 mm from
the directrix.

(b) Draw the quadrilateral ABCD
shown in Fig. 6. In this
quadrilateral A and C are
the focal points of an ellipse
and D is a point on the curve.
Construct the ellipse and draw
a tangent to the curve from
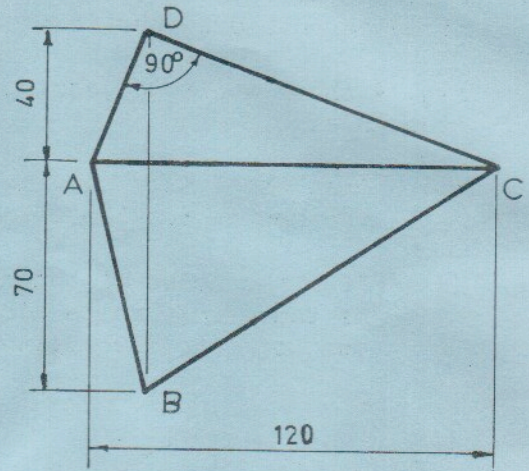the point B which is outside
the curve.

FIG. 6

7. Fig. 7 shows the projections
of a square-based prism,
side of base 60 mm,
intersected by an
equilateral triangular
prism of 74 mm side.

Draw the plan and elevation
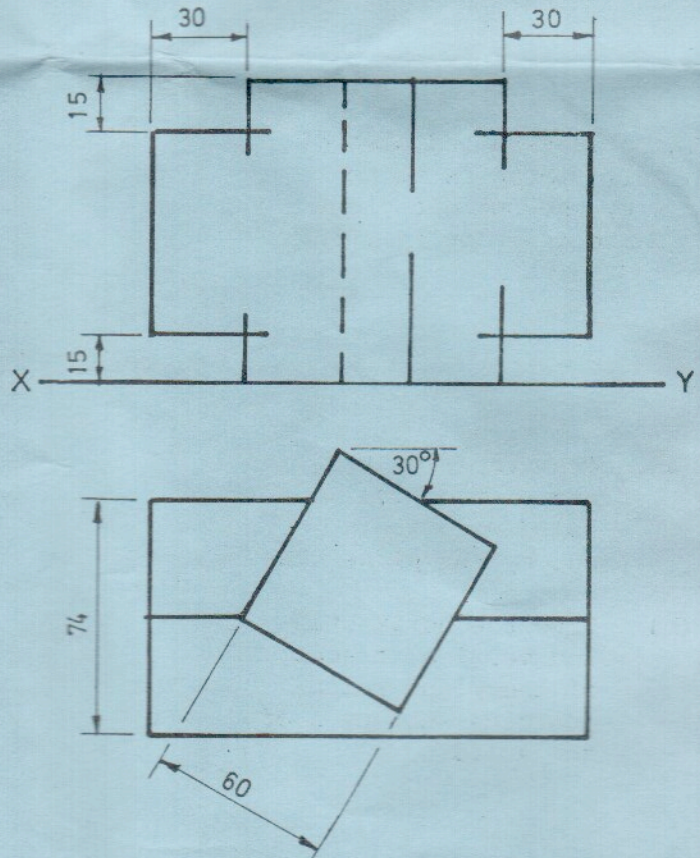of the solids showing all
lines of interpenetration.

FIG. 7