AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION, 2000

THURSDAY, 15 JUNE - AFTERNOON 2.00 p.m. to 5.00 p.m.

TECHNICAL DRAWING

ORDINARY LEVEL

PAPER I

(Plane and Solid Geometry)

200 marks

INSTRUCTIONS

(a) Answer **four** 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. An isometric view of a shaped solid is shown in Fig. 1.

(a) Draw an elevation of the solid looking in the direction of the arrow.
(b) Project a plan from the elevation.
(c) Project a new elevation from the plan of the solid which will show the true shape of surface A.

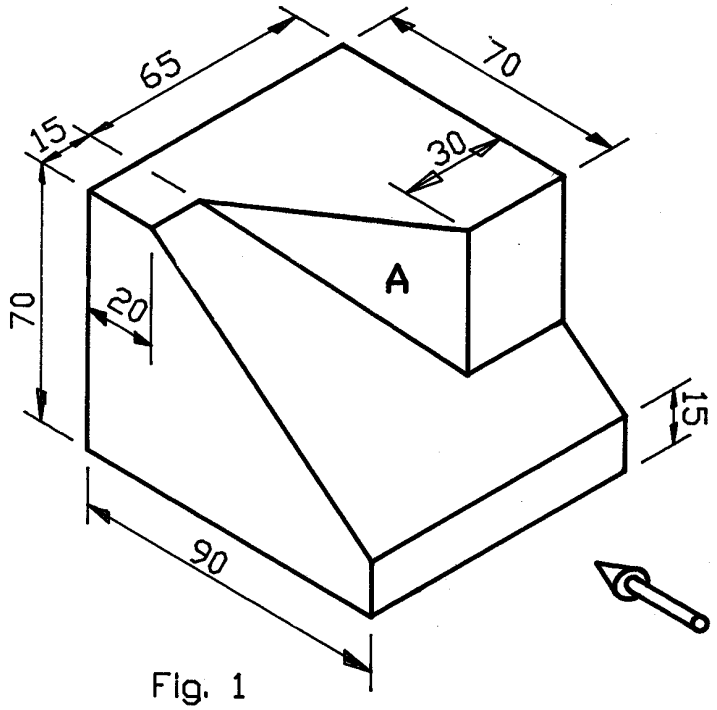


Fig. 1

2. Fig. 2 shows a quadrilateral ABDC in which the triangle BCD is twice the area of the triangle ABC. The triangle ABC has a perimeter of 240mm and its sides are in the ratio of 2:3:4. The sides CD and BD are equal in length.

(a) Draw the quadrilateral ABDC showing clearly how all points are obtained.
(b) Draw a square which is 0.75 times the area of the quadrilateral ABDC.

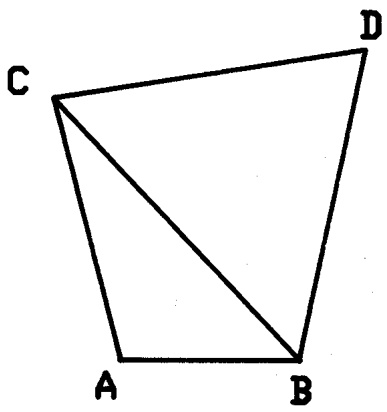


Fig. 2

3. Fig. 3 shows the plan and elevation of a right cone A and a sphere B in contact with each other. Also shown is the plan of a point P on the surface of the cone.

(a) Draw the given views and show the position of point P in elevation.
(b) Draw the plan and elevation of a sphere which shall rest on the horizontal plane and be in contact with the cone at point P.
(c) Draw the plan and elevation of another sphere at C resting on the horizontal plane, having diameter of 50mm, which shall be in contact with the cone A and the sphere B.

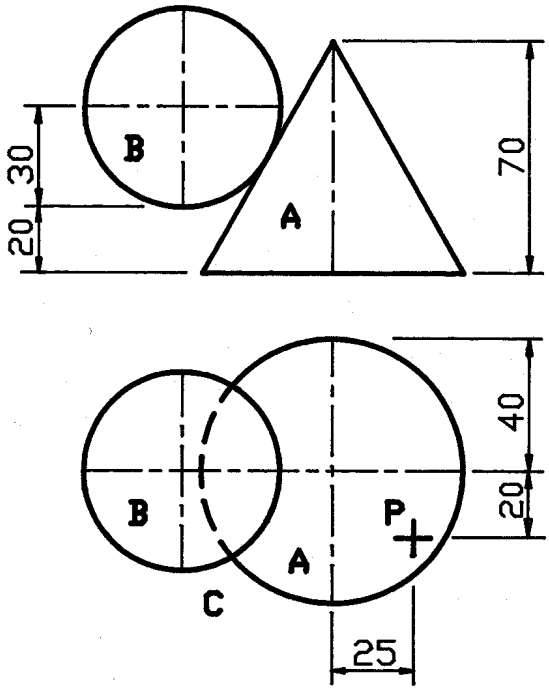


Fig. 3

4. Fig. 4 shows two circles, A and B, touching the line CD. Also shown are two points P and Q on the circumferences of the circles. Circle A rolls clockwise and circle B rolls anti-clockwise along the line CD.

Draw the paths of points P and Q as the circles roll along CD until the paths of P and Q intersect.

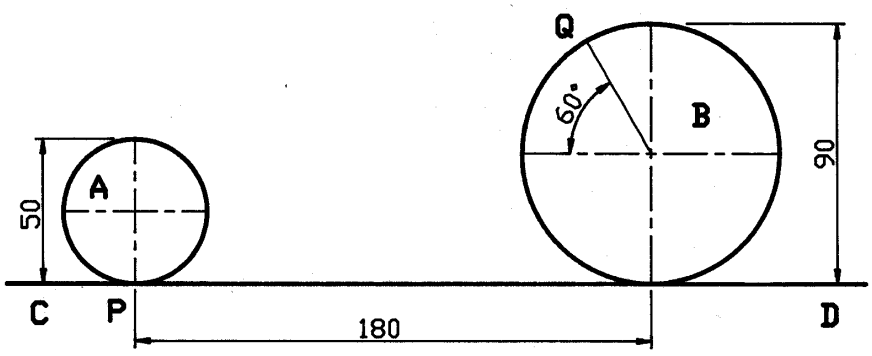


Fig. 4

5. The elevation and plan of a solid cut by an oblique plane VTH are shown in Fig. 5.

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

(b) Draw the true shape of the cut surface of the solid.

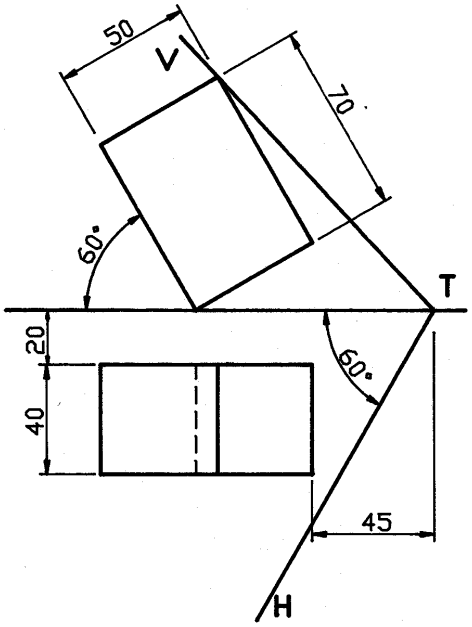


Fig. 5

6. **(a)** In an ellipse the minor axis is 100mm in length and the focal points are 96mm apart. Determine the major axis and draw the ellipse.

(b) Fig. 6 shows the direction of the axis and the focus of a hyperbola with an eccentricity of 1.5. The curve passes through the given point P. Show how the position of the directrix is located and draw a portion of the hyperbola.

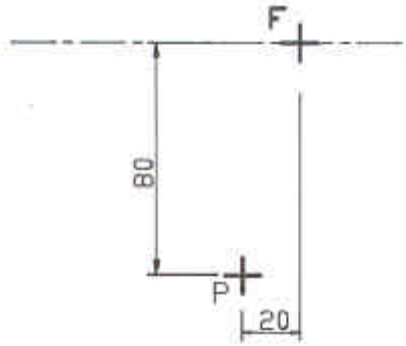


Fig. 6

7. Fig. 7 shows the elevation and incomplete plan of a solid resting on the horizontal plane which is intersected by a triangular prism.

Draw the plan, elevation and end-view of the solids showing all lines of interpenetration.

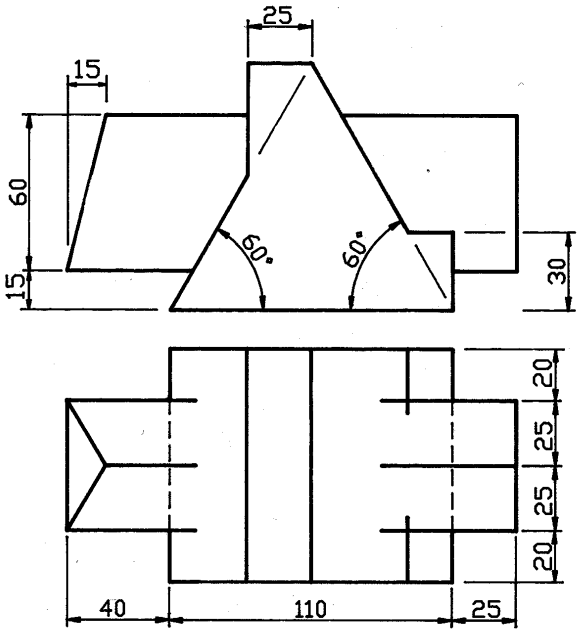


Fig. 7

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA
LEAVING CERTIFICATE EXAMINATION 2000

TECHNICAL DRAWING - ORDINARY LEVEL
PAPER II (A) – ENGINEERING APPLICATIONS

200 marks

FRIDAY, 16 JUNE - AFTERNOON 2.00 p.m. – 5.00 p.m.

INSTRUCTIONS

(a) Answer question 1 and two other questions.
(b) Drawings and sketches should be in pencil unless otherwise stated.
(c) Where dimensions are omitted they may be estimated.
(d) Credit will be given for neat orderly presentation of work.
(e) Candidates should work on one side of the paper only.
(f) The Examination Number should be written on each drawing sheet used.
(g) All dimensions are in millimetres.

OVER ®

1. Details of a "Pipe Welding Clamp" are given in Fig. 1 with a parts list tabulated below.

INDEX	PART	REQUIRED
1	Body	1
2	Hinge	1
3	Jaw	1
4	Screw	1
5	Spindle	1
6	Circlip	1

(a) Make the following drawings of the assembly in first or third angle projection.

(i) A sectional side elevation on section plane SS.
(ii) An end elevation viewed in the direction of arrow C.

(b) Insert the following on the drawings:

(i) Title:- Pipe Welding Clamp.
(ii) ISO projection symbol.
(iii) Four leading dimensions. (100 marks)

2. The elevations of two intersecting pipes are shown in Fig. 2.

(a) Draw both views as given and complete the side elevation.

(b) Draw the surface development of both pipes.

(c) By means of large freehand sketches distinguish between:

(i) A rolled edge;
(ii) A wired edge. (50 marks)

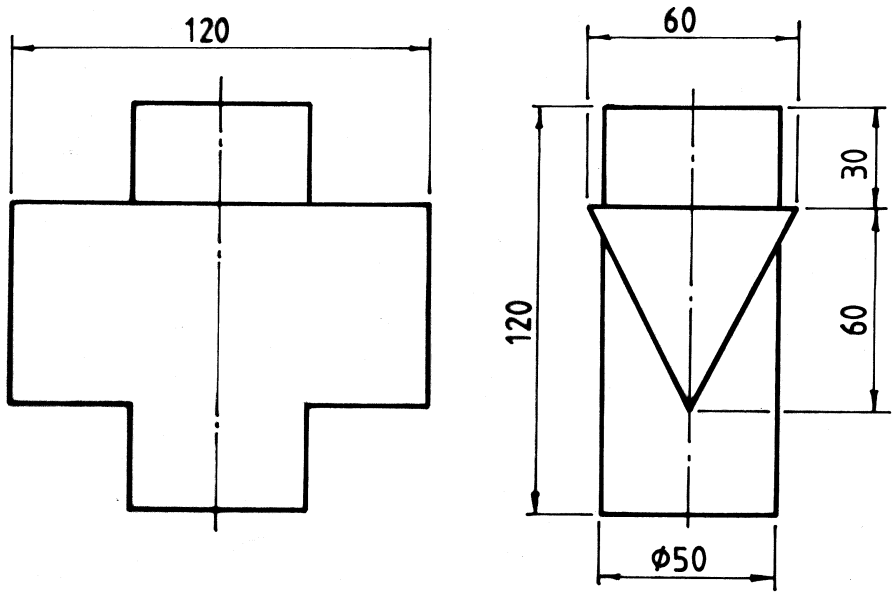


FIG.2 FIOR 2

3. **(a)** Draw a radial plate cam with a minimum radius of 30mm and a clockwise rotation, to impart the following motion to an in-line follower. Camshaft diameter 20mm.

0º to 180º	Rise 60mm with uniform Acceleration and Retardation.
180º to 225º	Fall 20mm with Uniform Velocity.
225º to 270º	Dwell.
270º to 360º	Return to initial position with Simple Harmonic Motion.

Include the displacement diagram as part of the solution.

(b) Fig. 3 shows a pin jointed mechanism. The cranks AO and BQ revolve about O and Q at the same speed and in the same direction.

(i) Using a line diagram to represent the linkage, plot the locus of R.

(ii) Draw a profile of a simple machine guard about the mechanism with a minimum clearance of 15mm.

(50 marks)

OVER ®

4. **(a)** Using the data table below, make a fully dimensioned drawing of the machine part in Fig. 4 showing all specifications.

1	Screw Thread: Metric 40, Pitch 3.5, Length 40
2	Undercut: Depth 5, Length 5
3	Taper: Maximum diameter 60, Minimum diameter 40, Length 50, Woodruff keyway diameter 40 and Depth 8 - mid length
4	Length 40, Diameter 60
5	Diameter 80, Length 30, Chamfer 5 x 45°, Finish diamond knurl

(b) **(i)** Identify the machine part shown in Fig. 5.

(ii) Name the parts 1, 2, 3 and 4.

(c) With the aid of freehand sketches explain the following engineering terms:

(i) Keyway;
(ii) Blind Hole;
(iii) Collar. (50 marks)

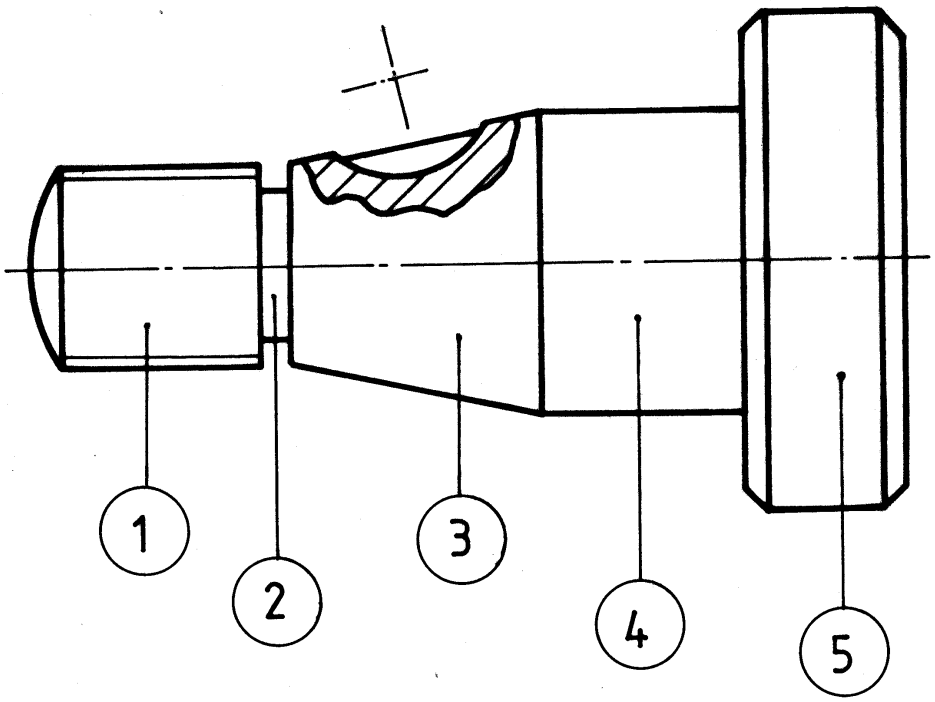


FIG.4

FÍOR 4

5. Answer SECTION A **or** SECTION B but not both.

SECTION A

(a) Draw two coils of a round section compression spring to the following specifications:

Outside diameter	120mm
Inside diameter	60mm
Pitch	90mm

(b) With the aid of large freehand sketches explain the following engineering terms and print the correct abbreviation with each sketch.

(i) Centres;
(ii) Undercut;
(iii) Spotface.

OR

SECTION B

(a) List a selection of six commands necessary to produce the drawing in Fig. 6.1.

(b) Differentiate between the computer terms **Hardware** and **Software**.

(c) List three types of plotter suitable for plotting CAD drawings.

(d) Which of the following would be the most suitable snap resolution for the drawing in Fig. 6.1:

(i) 0.05, **(ii)** 0.1, **(iii)** 2.5, **(iv)** 2.7, **(v)** 10.

(e) By means of sketches explain the purpose of the following commands.

(i) Array;
(ii) Trim;
(iii) Zoom.

(50 marks)

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION, 2000

TECHNICAL DRAWING - ORDINARY LEVEL - PAPER II (B)
BUILDING APPLICATIONS

FRIDAY, 16 JUNE - AFTERNOON 2.00 p.m. to 5.00 p.m.

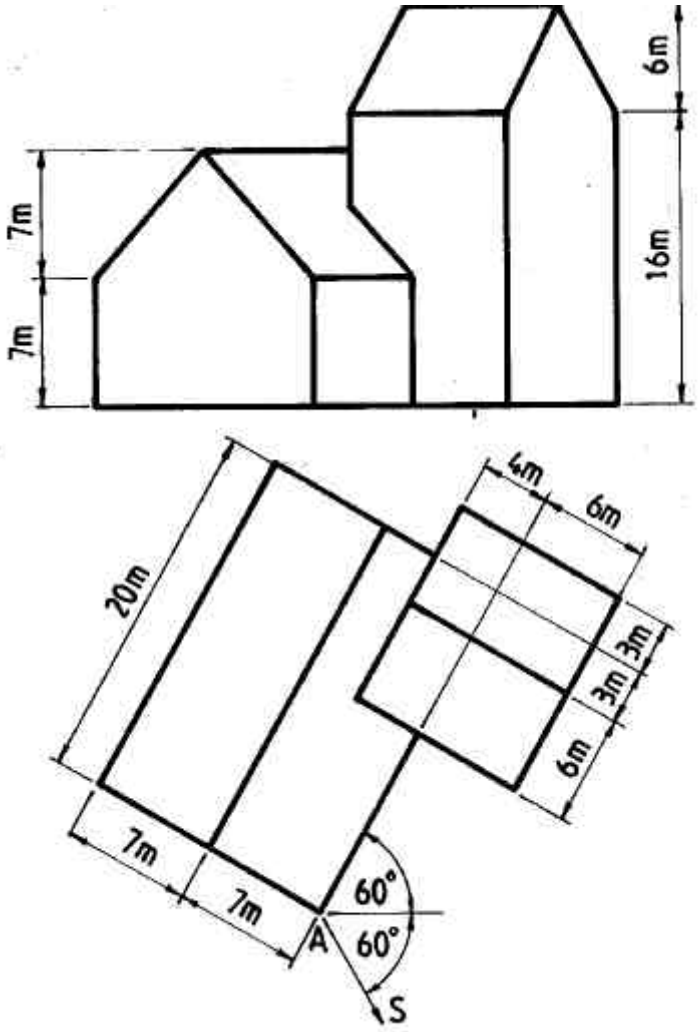
(200 MARKS)

INSTRUCTIONS

(a) Answer four 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) First or third angle projection may be used.
(f) All measurements are given in metres or millimetres.

1. Fig. 1 shows the outline plan and elevation of a building. Draw the given plan and make a perspective drawing of the building when the position of the spectator is 18 m from the corner A, the picture plane touching the corner A, and the horizon line 15 m above the ground line.

Scale 1 : 200



2. Fig. 2 shows the outline plan and elevation of a roof. Surface A has a pitch of 35°; surfaces B and E have a pitch of 40° and surfaces C and D have a pitch of 60°.

(a) Draw the given plan and elevation of the roof..

(b) Develop the surface E.

(c) Find the dihedral angle between the surfaces A and B.

Scale 1 : 100

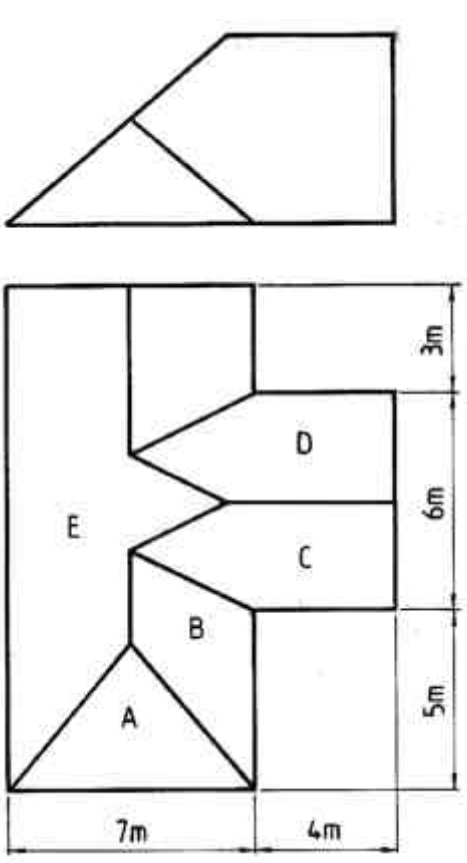


FIG.2

3. Fig. 3 shows the plan and elevation of a building.
A pictorial view of the building is also shown.
Draw the given views and determine the shadows cast in plan when the direction of light is as shown.

Scale 1 : 200

FIG.3

4. Fig. 4 shows the outline plan of two adjoining hyperbolic paraboloid roof surfaces ABEF and BCDE. The roof perimeter is a regular hexagon in plan. The corners B, F and D are at ground level, corners A and C are 8m above ground level, and corner E is 22m above ground level.

(a) Draw the given plan of the roof and project an elevation and an end elevation.

(b) Determine the true shape of the section S-S through the roof. Scale 1 : 200

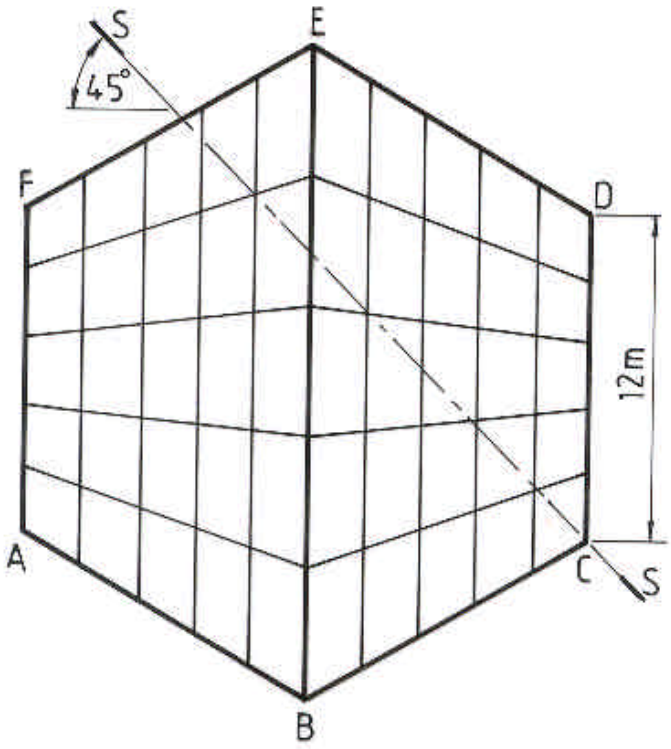


FIG. 4

5. Fig. 5 shows the plan and elevation of a shaped building stone.

Draw the given views and draw an isometric view of the stone.

Scale 1 : 10

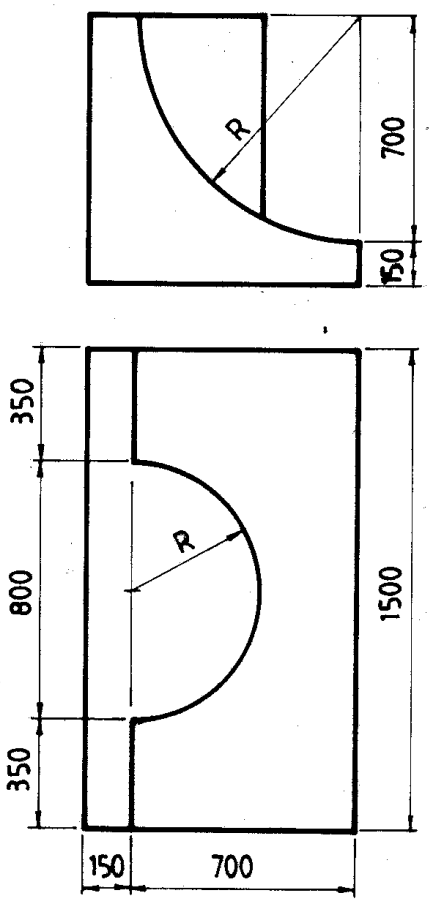


FIG. 5

6. Fig. 6 shows the outline plan, elevation and end elevation of a building. A pictorial view of the building is also shown.. The main building is semi-elliptical in plan and the elevation of the entrance lobby is a parabola.

Draw the given plan, elevation and end elevation of the building.

Scale 1 : 200

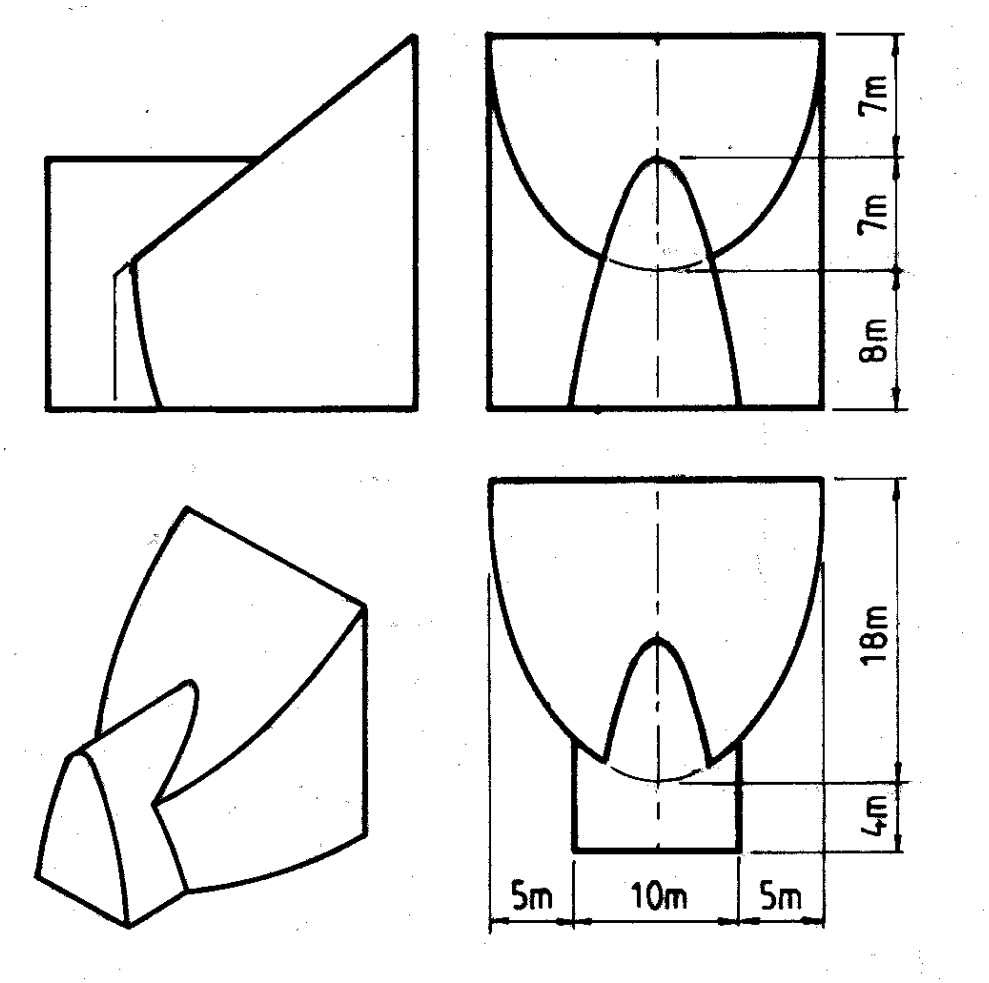


FIG.6

7. The accompanying drawing shows ground contours at ten-metre vertical intervals on a map.

(a) On the drawing supplied draw a vertical section (profile) on the line DE.

(b) A, B and C are outcrop points on the surface of a stratum of ore. Determine the dip and strike of the stratum.

(c) Draw the outline of the outcrop between A and B and between A and C.

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

SCRÚDÚ ARDTEISTIMÉIREACHTA

2000

LÍNÍOCHT THEICNIÚIL - GNÁTHLEIBHÉAL

PÁIPÉAR II(A)

FEIDHMIÚCHÁIN INNEALTÓIREACHTA

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION

2000

TECHNICAL DRAWING - ORDINARY LEVEL

PAPER II(A)

ENGINEERING APPLICATIONS

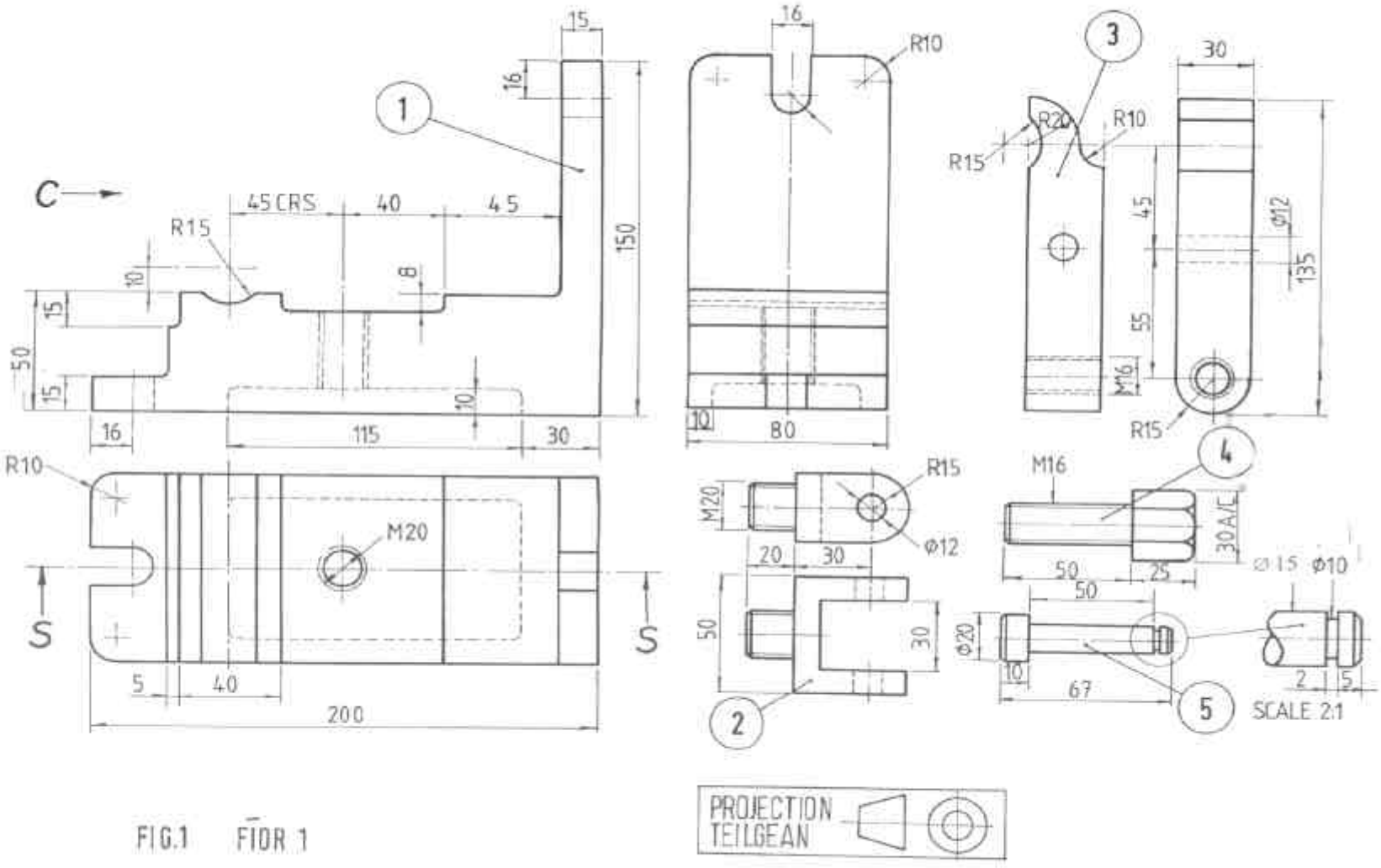

1
C
45 CRS
40
45
R15
10
15
50
15
16
115
30
150
8
10
S
S
R10
M20
5
40
200
16
15
R10
10
80
2
M120
R15
Φ12
20
30
50
30
3
R20
R10
R15
30
45
55
M16
Φ12
135
R15
4
M16
30 A/F
50
25
Ø15
Φ10
50
Φ20
10
67
5
2
5
SCALE 2:1
PROJECTION
TEILGEAN

FIG.1 FIOR 1

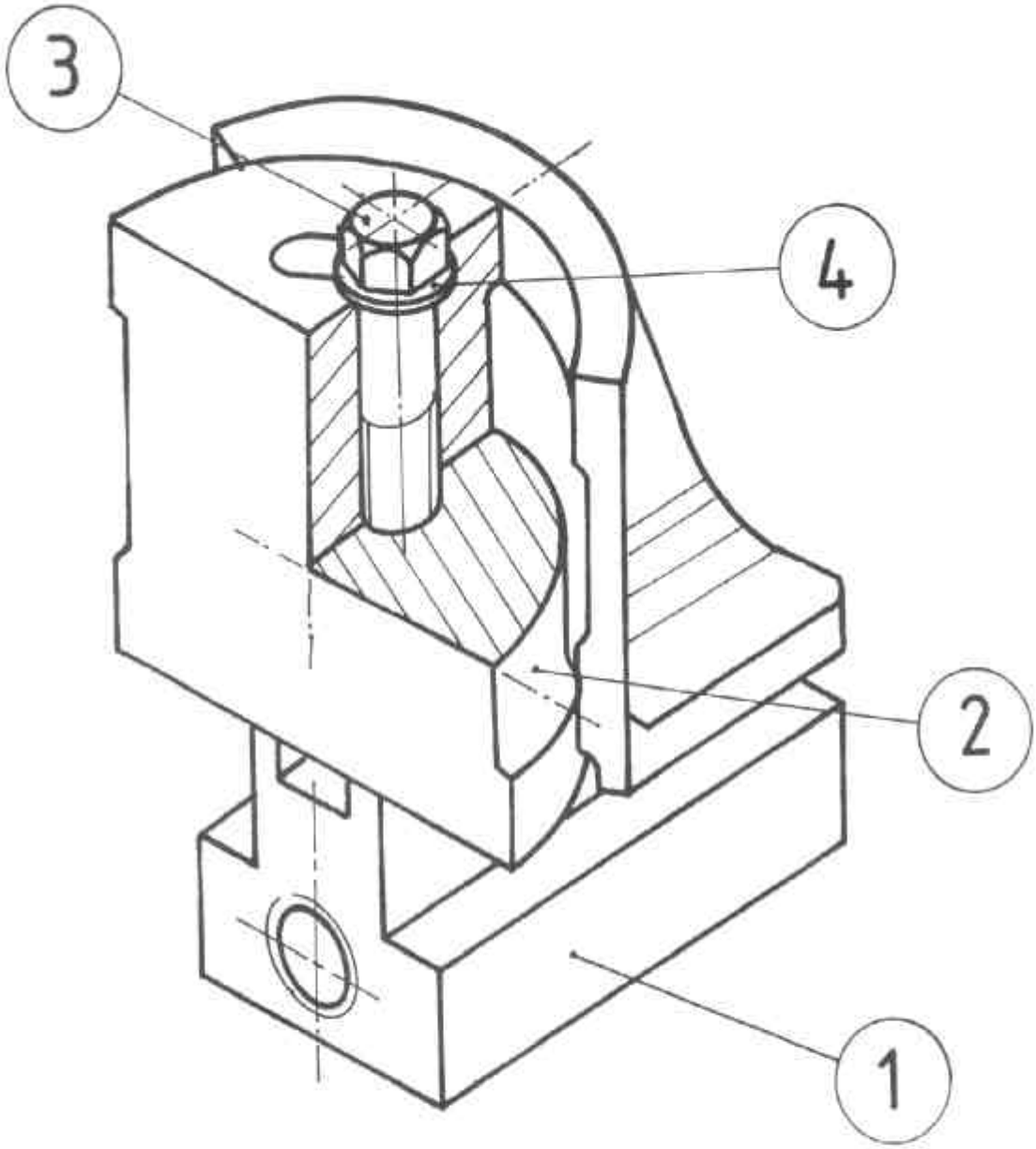


FIG.5

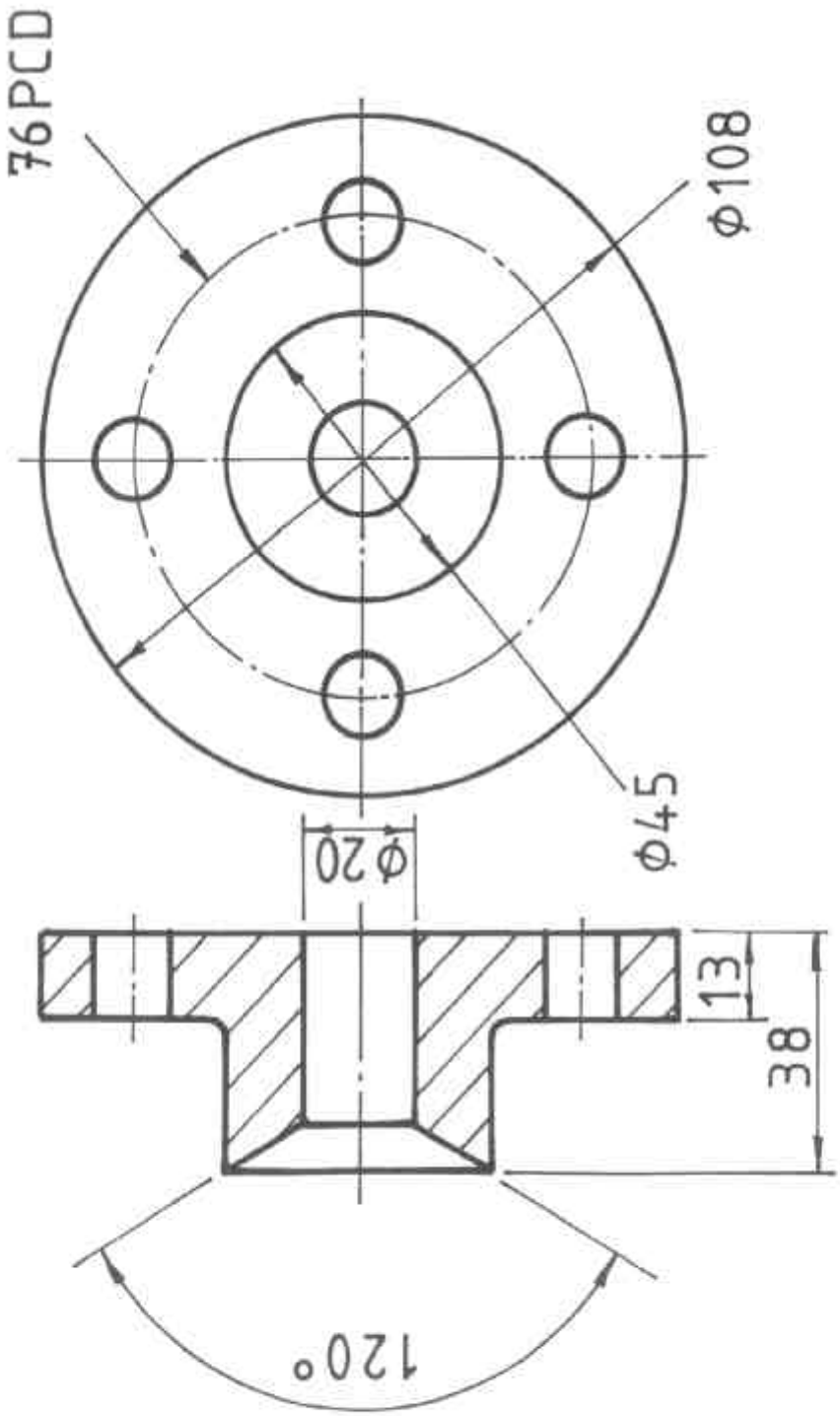


FIG. 61