

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)

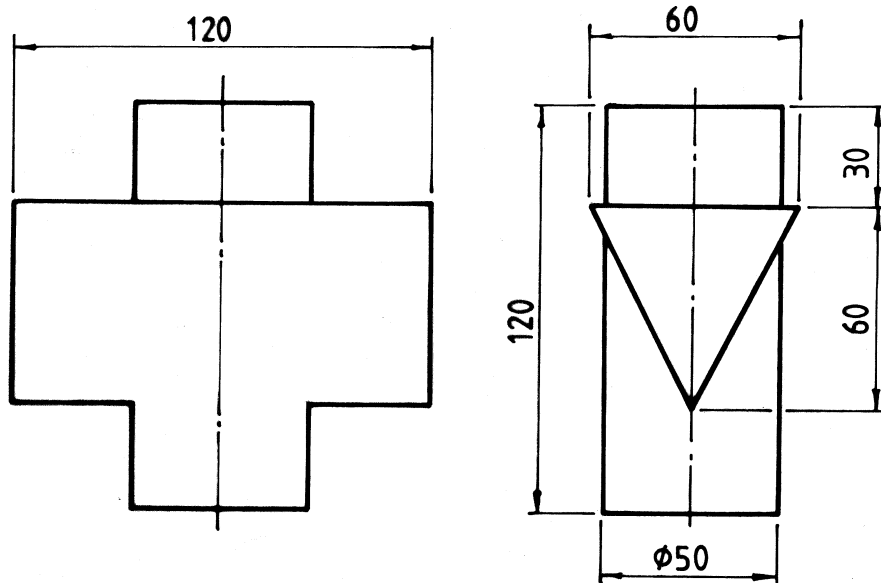


FIG.2 FIG.2

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.

0° to 180°	Rise 60mm with uniform Acceleration and Retardation.
180° to 225°	Fall 20mm with Uniform Velocity.
225° to 270°	Dwell.
270° to 360°	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)

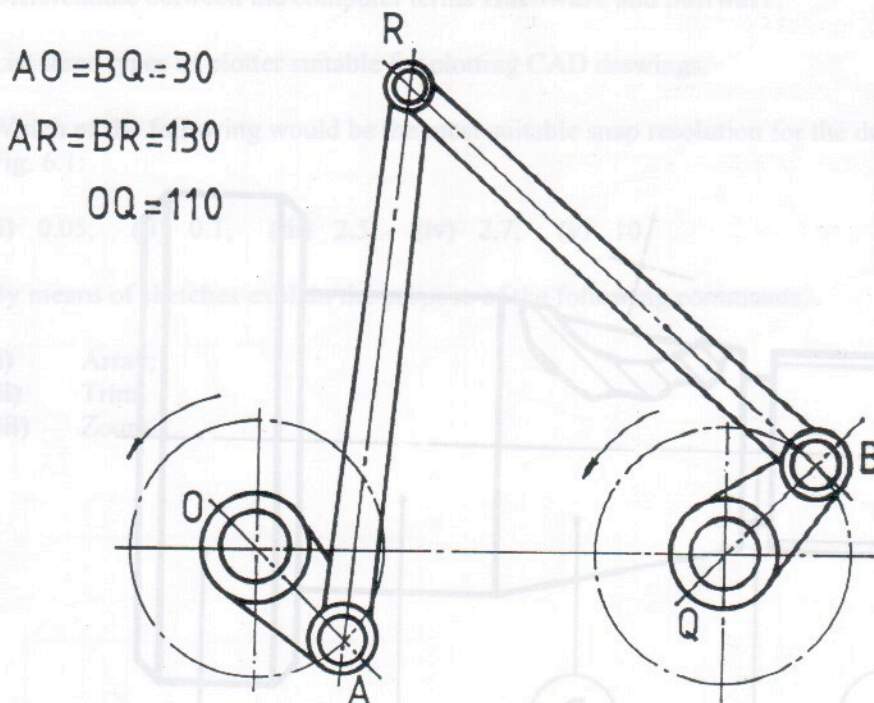


FIG.3

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)

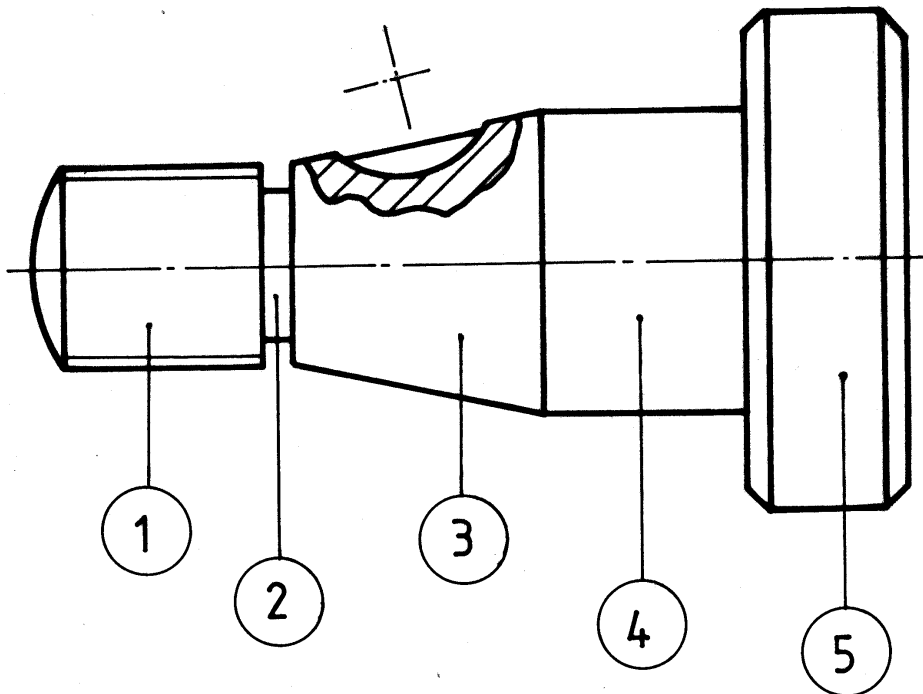


FIG.4
FÍOR 4

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)

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SCRÚDÚ ARDTEISTIMÉIREACHTA

2000

LÍNÍOCHT THEICNIÚIL - GNÁTHLEIBHÉAL

PÁIPÉAR II(A)

FEIDHMIÚCHÁIN INNEALTÓIREACHTA

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PAPER II(A)

ENGINEERING APPLICATIONS

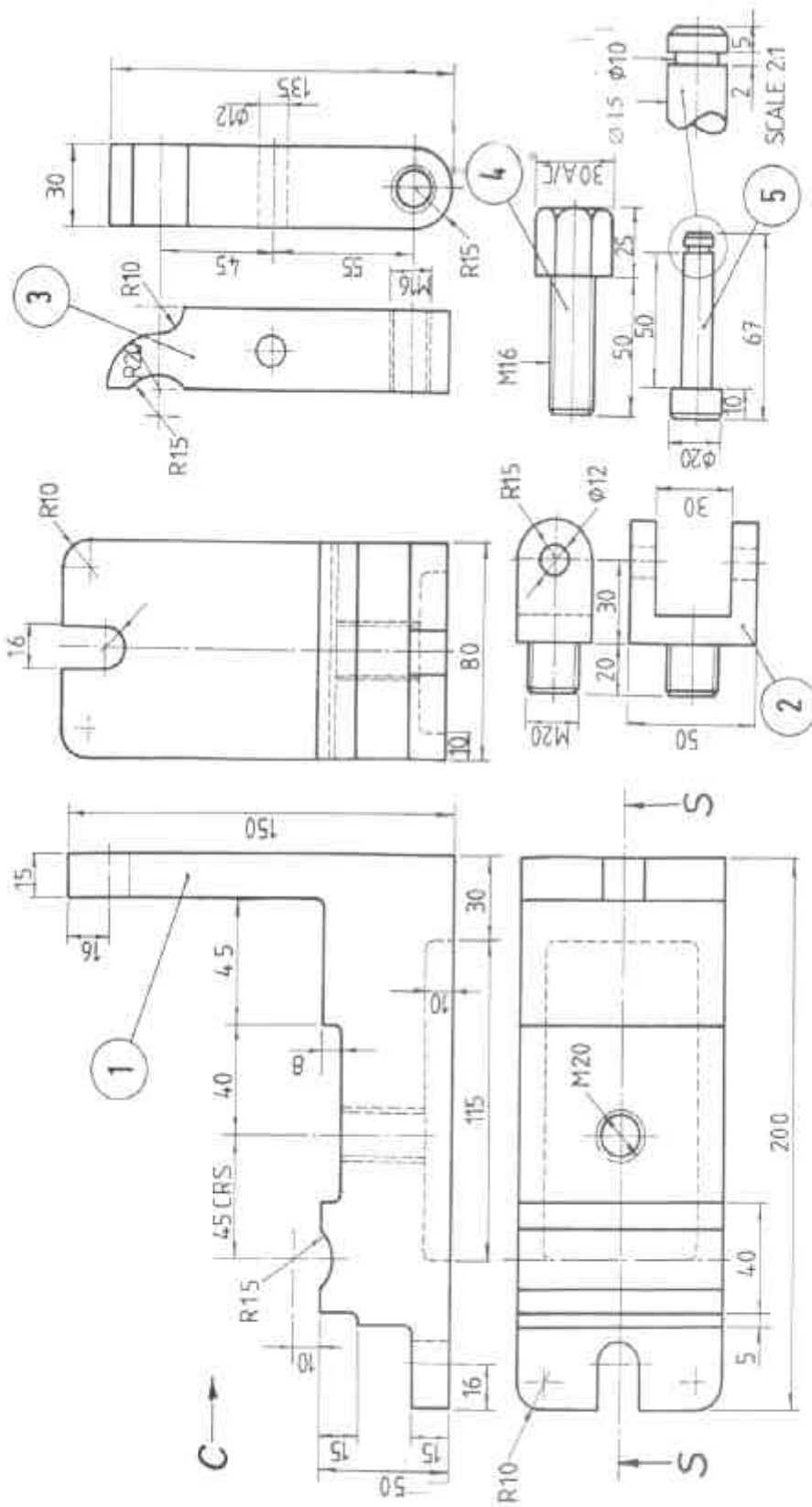


FIG.1 F10R.1

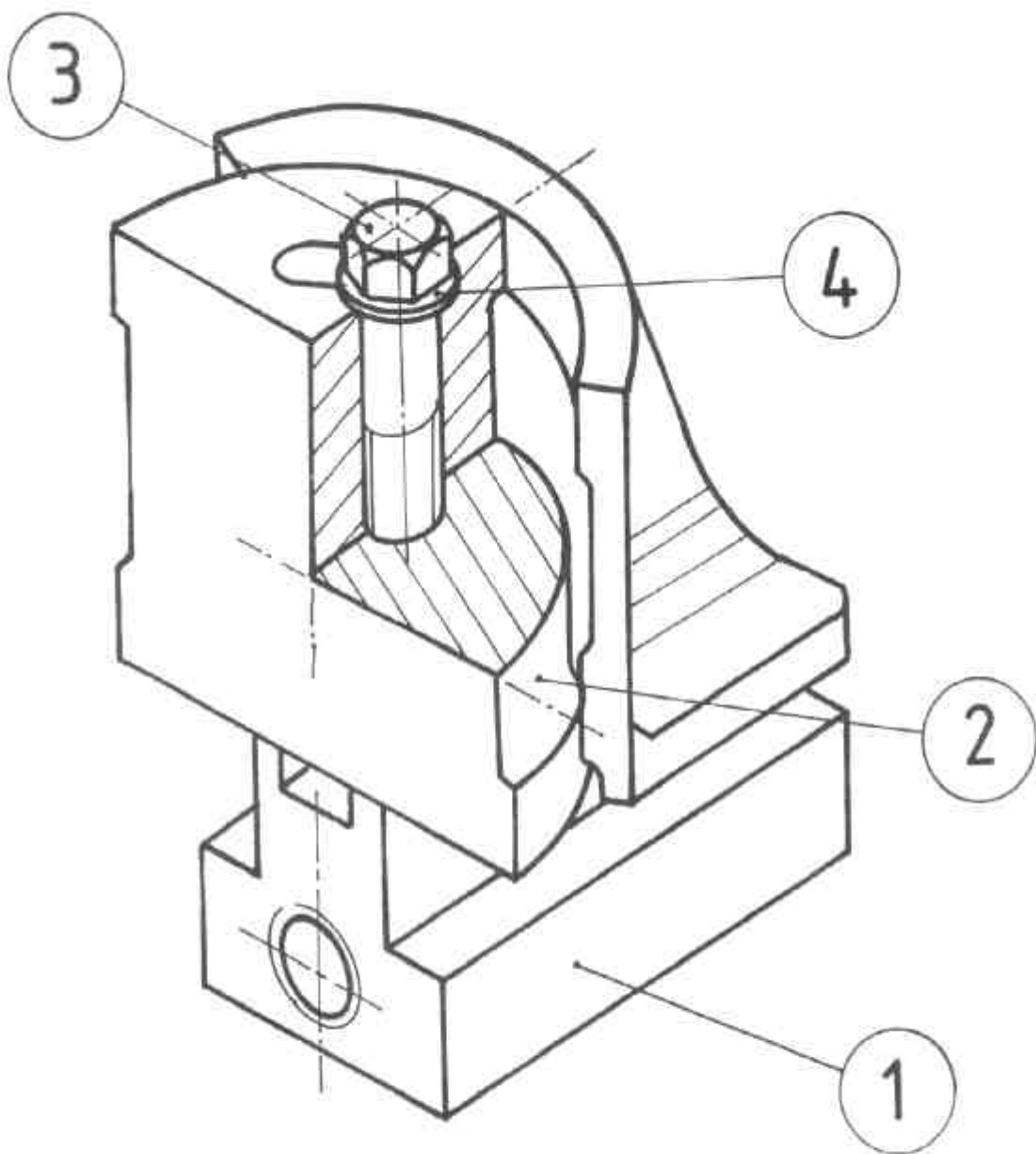


FIG. 5

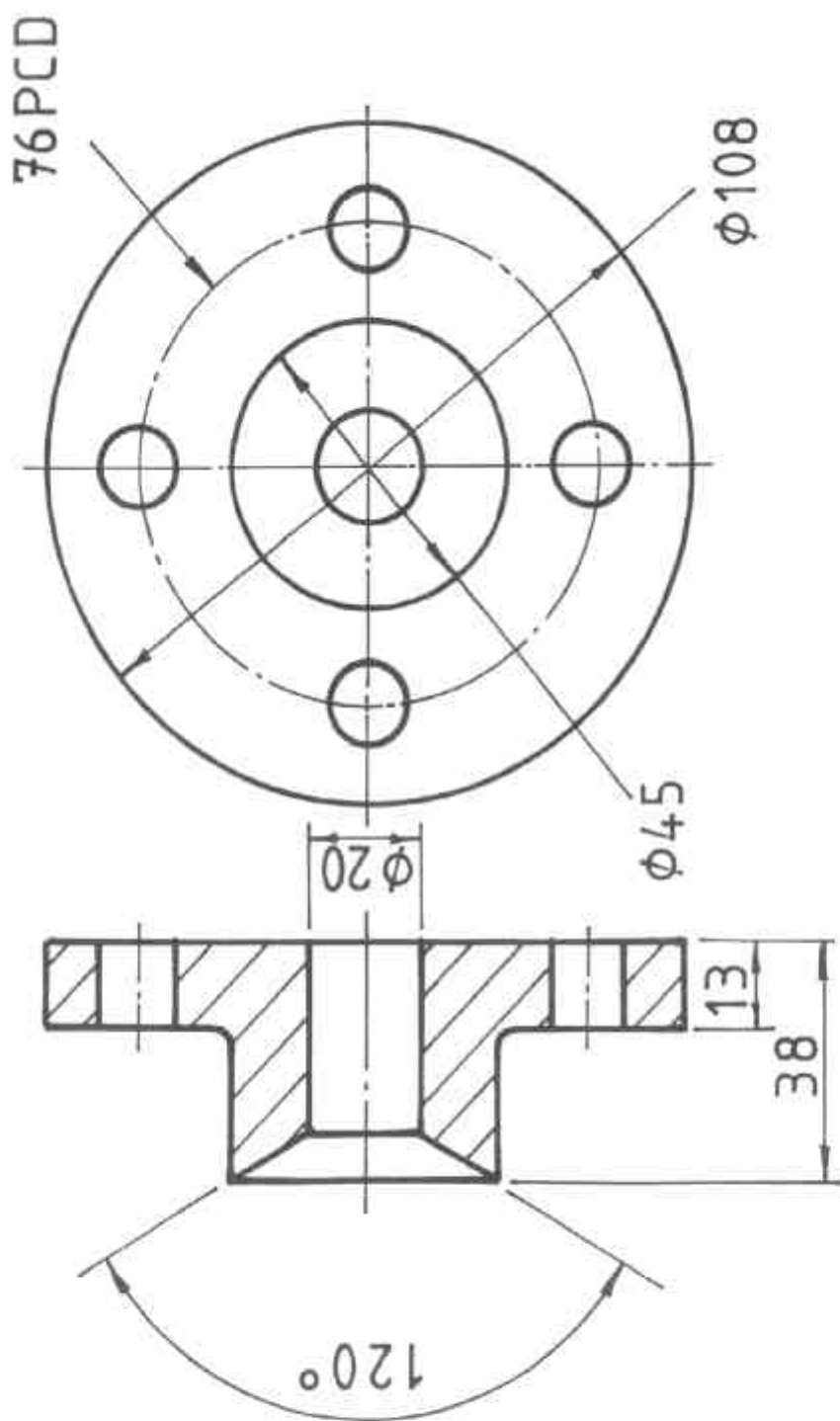


FIG. 6.1