LEAVING CERTIFICATE EXAMINATION, 1990

TECHNICAL DRAWING - HIGHER LEVEL

PAPER II(A) - ENGINEERING APPLICATIONS

THURSDAY, 21 JUNE - MORNING 9.30 to 12.30

200 Marks

INSTRUCTIONS

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

1. Three views of an EDGE CLAMP are shown in Fig.1.

(a) Using the scale provided, make a full size detailed working drawing of part number 1 (Clamp Body). The detailed drawing should describe fully the shape of the part and should be fully dimensioned.

(b) Insert the following on the drawing:-

(i) Symbol for surfaces to be machined.

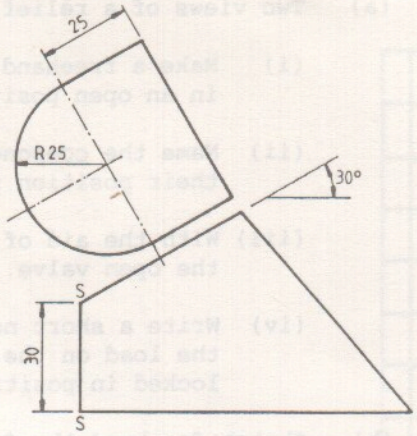
(ii) Projection symbol.

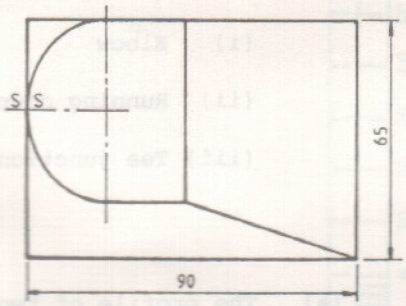
(iii) Title: **CLAMP BODY.**

9	PIN	1
8	SET SCREW	1
7	SUPPORT SCREW	1
6	STUD	1
5	NUT	1
4	SPHERICAL WASHER	1
3	SPHERICAL WASHER	1
2	CLAMP	1
1	CLAMP BODY	1
INDEX	Part	No. reqd

2. Fig. 2 shows a sheetmetal transition piece.

FIG. 2
FÍOR 2





(a) Draw the given views and project an end elevation.

(b) Draw a one piece development of the transition piece with the seam at SS.

(c) Sketch freehand and name a sheetmetal joint suitable for the piece.

(d) Using a separate sketch show the seam allowance necessary to make the joint.

3. (a) Draw full size an involute tooth for a gear wheel with 25 teeth, module of 10mm and a pressure angle of 20°.

Tabulate on the sheet, close to the drawing, the following values for the gear wheel:

(i) Pitch circle diameter.

(ii) Circular pitch.

(iii) Addendum circle diameter.

(iv) Dedendum circle diameter.

(v) Base circle diameter.

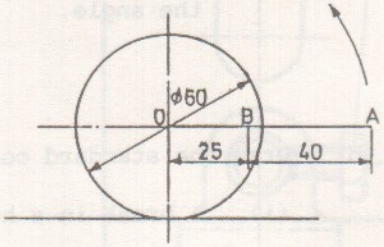


FIG. 3. FÍOR. 3.

(b) The arm OA is fixed to a disc as shown in Fig. 3. Plot the locus of a point which moves with simple harmonic motion from A to B and back to A while the disc makes one revolution along the straight line in the direction shown.

4. (a) Two views of a relief valve are shown in Fig. 4.

(i) Make a freehand sketch of the assembly to show the valve in an open position.

(ii) Name the component parts of the assembly and indicate their position in the sketch.

(iii) With the aid of arrows show the flow direction through the open valve.

(iv) Write a short note on the drawing sheet to explain how the load on the compression spring may be adjusted and locked in position.

(b) Sketch freehand the following pipe fittings:-

(i) Elbow

(ii) Running coupling

(iii) Tee junction

5. (a) The profile of two threads of an *acme* screw is shown in Fig. 5.

(i) Draw two full threads of the *acme* screw. The screw should be a single start right hand thread with an outside diameter of 120mm.

(ii) Construct the helix angle for the screw thread and dimension the angle.

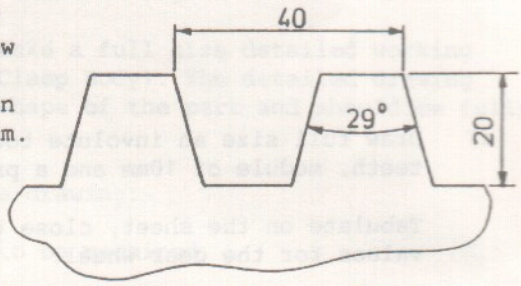


FIG. 5. FÍOR 5.

(b) Draw the standard convention for:-

(i) A break in a hollow shaft.

(ii) Holes on a circular pitch.

(iii) A stud assembled in a blind hole.

6. Fig. 6 shows three views of an anchor block. Draw an isometric view of half the block on section plane AA and having X as the lowest point on the drawing. Hatch the cut faces and add the title **ANCHOR BLOCK.**

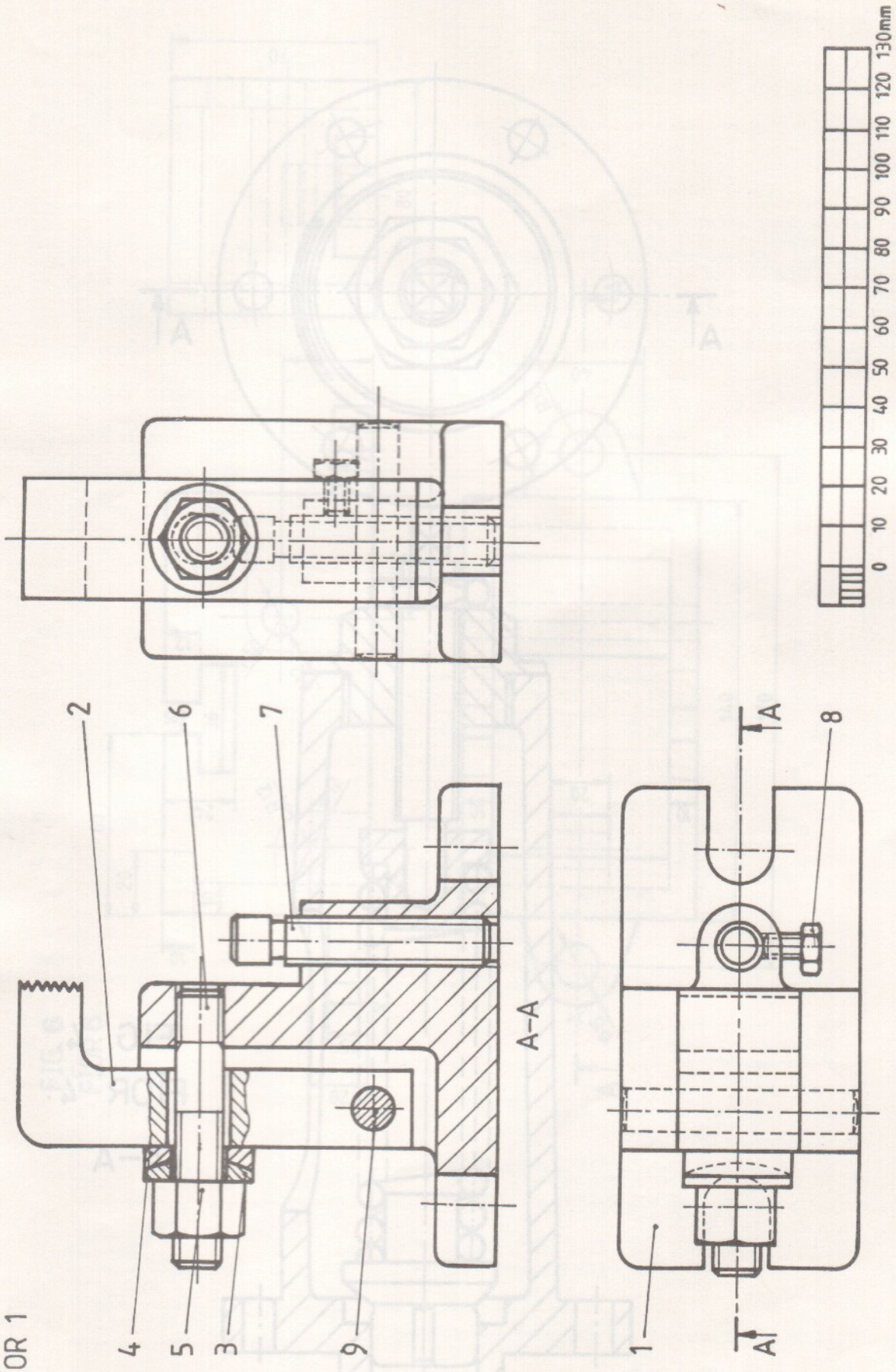


FIG. 1
FÍOR 1

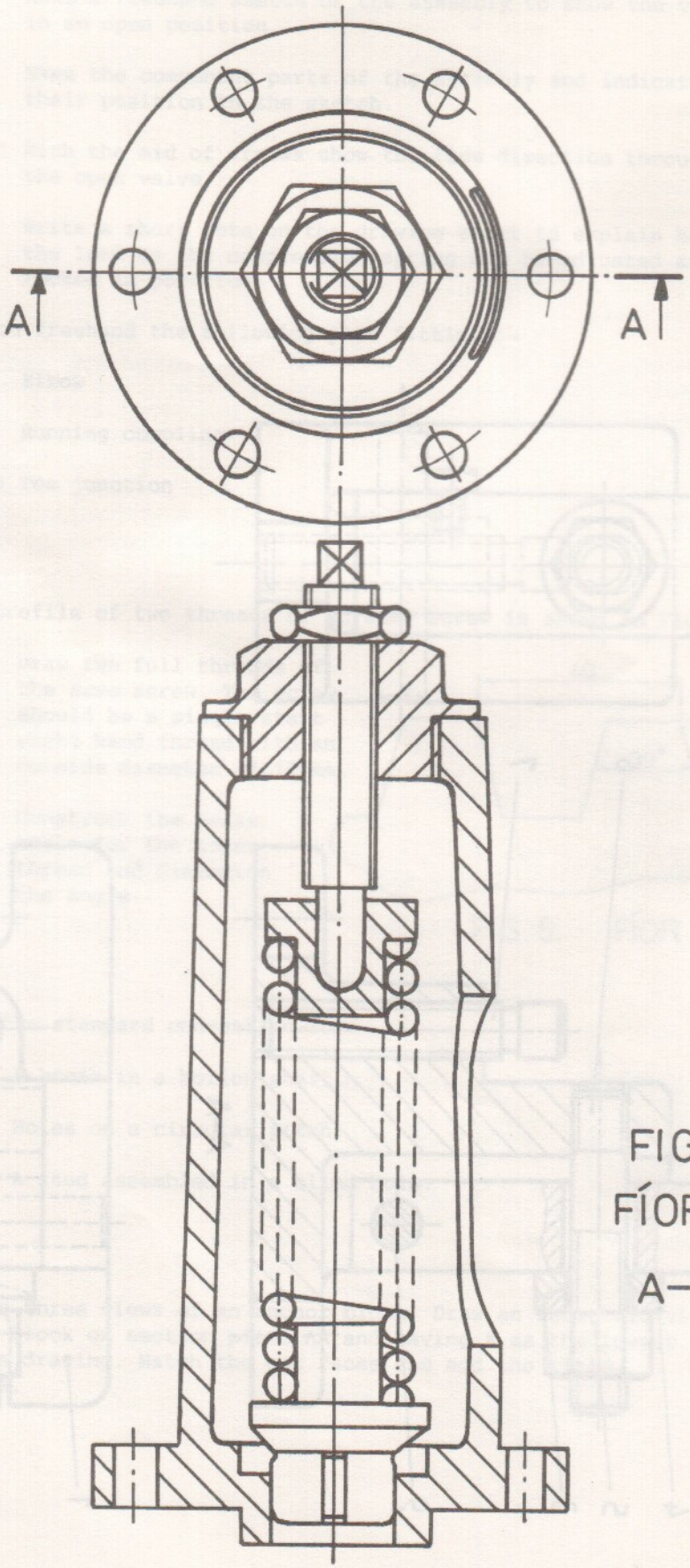


FIG. 4.
FÍOR 4.
A–A

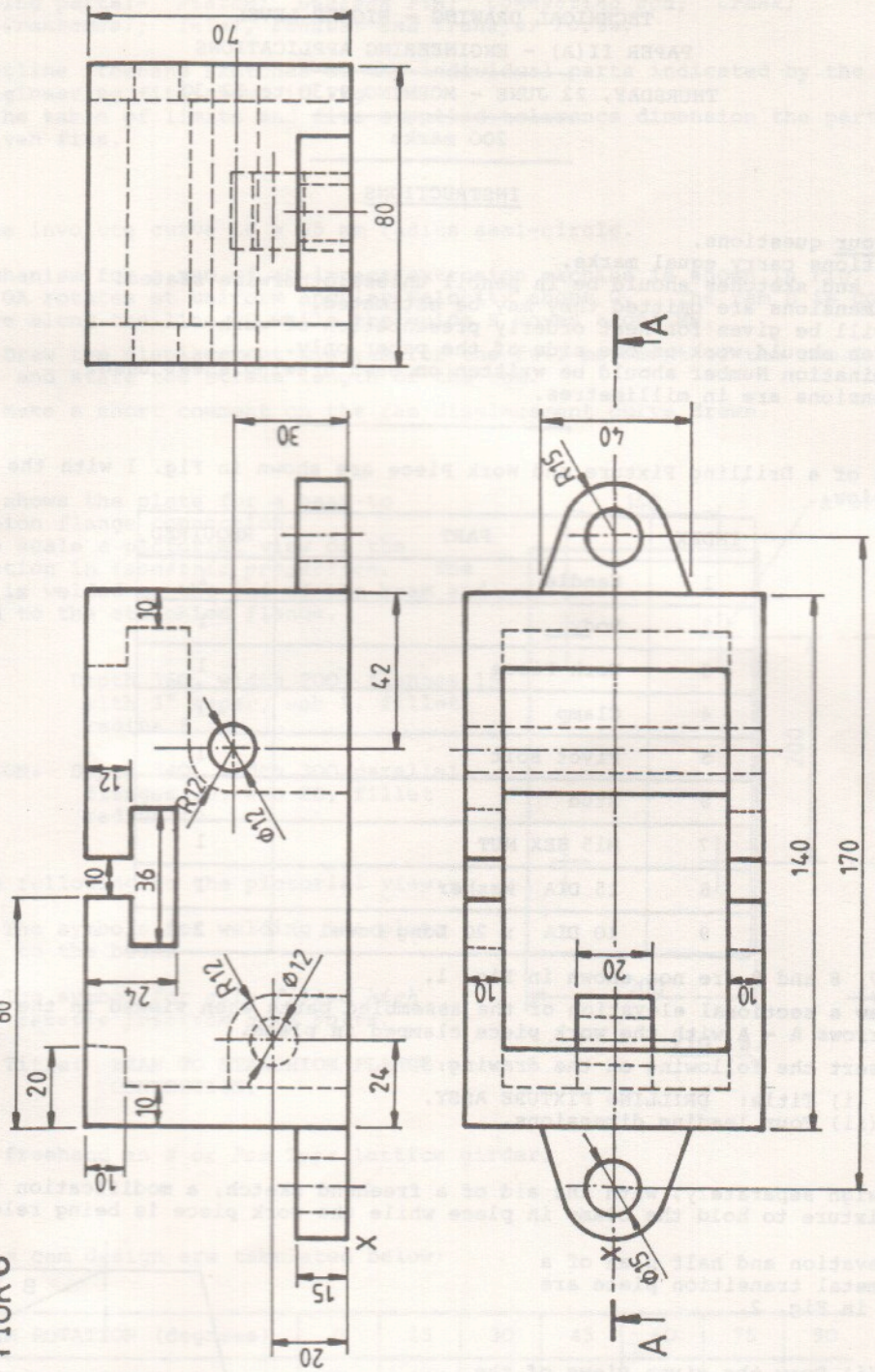


FIG. 6
FÍOR 6