LEAVING CERTIFICATE EXAMINATION, 1986

TECHNICAL DRAWING - HIGHER LEVEL

PAPER II(A) - ENGINEERING APPLICATIONS

THURSDAY, 26 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. Figure 1 shows two views of a valve body in third angle projection.

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

(i) A sectional elevation when viewed in direction of arrows A-A.

(ii) A plan projected from (i)

Hidden edges need not be shown.

(b) Insert the following on the drawing:-

(i) Title: VALVE BODY

(ii) ISO projection symbol.

(iii) Four leading dimensions.

2. Two views of a transition piece are shown in Fig. 2.

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

(ii) Draw and dimension the true shape for the open top 'A' of the piece.

(iii) Draw a half symmetrical development of the piece and show a suitable position for the seam.

(iv) Sketch freehand and in pictorial projection a sheetmetal joint suitable for the piece.

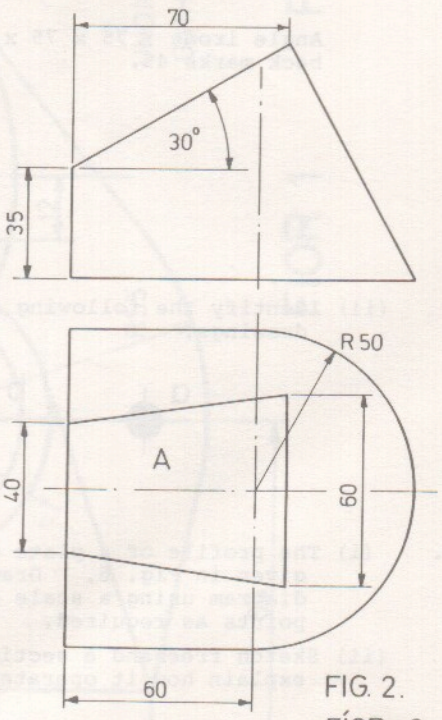


FIG. 2.
FÍOR 2.

3. Details of a globe valve are shown in Fig. 3.

(i) Make a freehand sketch showing the assembled valve in the open position. The view should be in section showing items 1, 2, 3, 4, 5, 6 and the lower part of spindle 7. Indicate on the sketch the direction of flow through the valve. With the aid of brief notes and a separate sketch, show how the liquid is prevented from leaking up the spindle.

(ii) Draw an expansion bend flange, for a steam system, given the following specification:-

Flange	:	110 mm outside diameter, 12 mm thick.
Bolt holes	:	6 holes 10 mm diameter, on 90 mm pitch circle diameter.
Spigot	:	70 mm diameter, 5 mm thick.
Bore	:	30 mm diameter.

Fully dimension and title the drawing. Indicate, using the symbol, the surfaces to be machined.

4. (i) Draw two involute spur gears showing two teeth of each gear in mesh. The gearing gives a reduction ratio 5 : 4. Drive gear details: module 10 mm, 25 teeth, pressure angle 20°. Insert in tabular form all the important gear dimensions.

(ii) The line diagram for two gear trains are shown in Fig. 4. State for each gear train:-

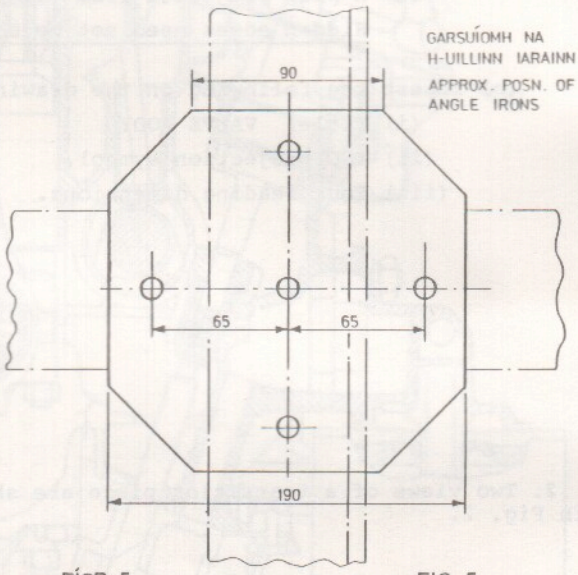
(a) Type.

(b) Gear ratio (Driver to driven).

(c) Direction of rotation for the driven gear.

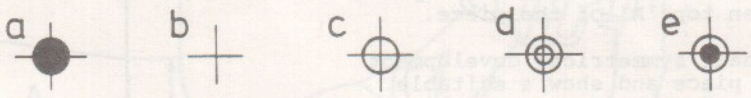
5. (i) A 10 mm thick gusset plate for securing crossing angle irons is shown in Fig. 5. Draw a pictorial view of the connection showing the plate and the angle irons assembled. The connection is secured with 10 mm shop rivets. Show only the location of the rivets and add a suitable title.

Angle irons : 75 x 75 x 8, radius 5, back marks 45.



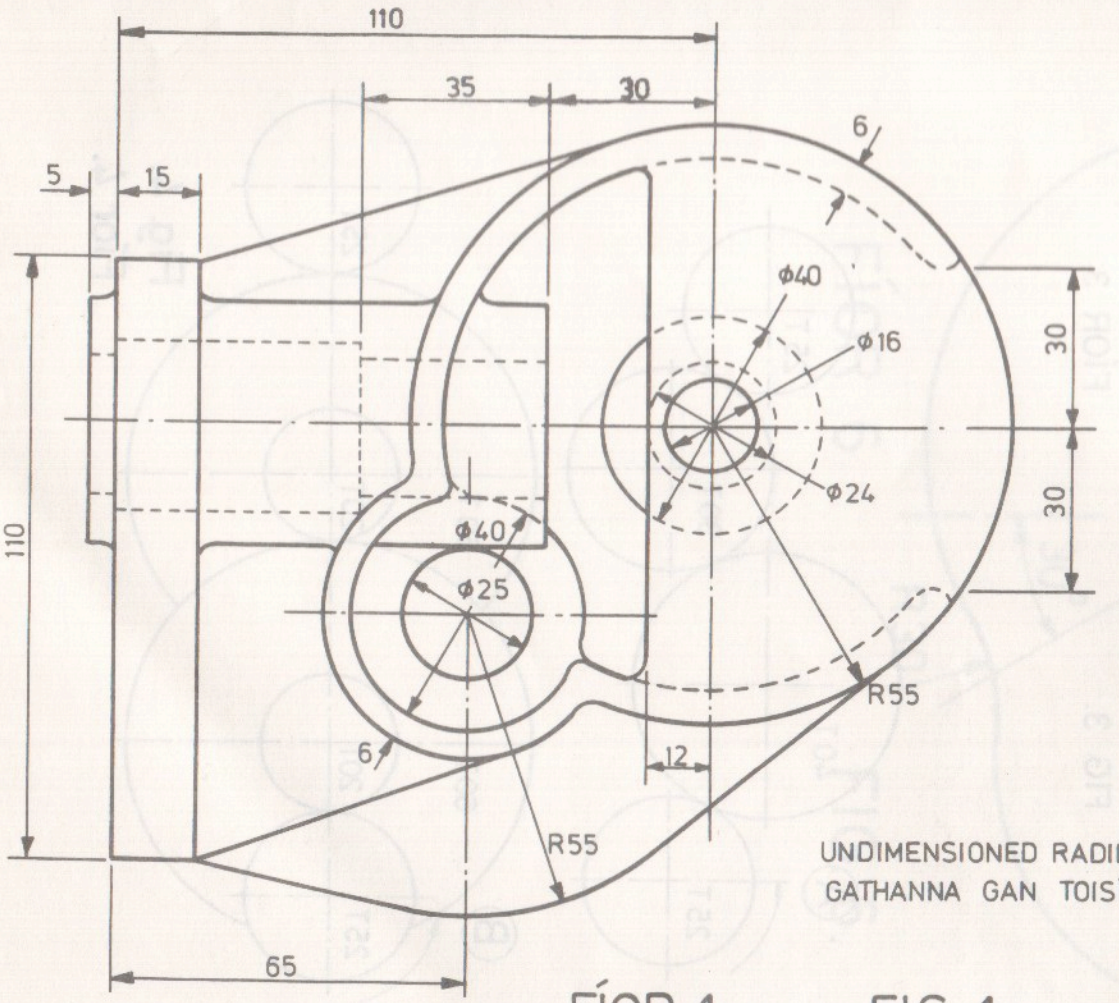
FÍOR 5. FIG. 5.

(ii) Identify the following symbols used for fasteners on structural steel drawings.



6. (i) The profile of a plate cam with a 20 mm diameter in-line follower is given in Fig. 6. Draw the given view, and the cam displacement diagram using a scale of 10 mm to 30° of cam rotation, with intermediate points as required.

(ii) Sketch freehand a sectional view of any type of thrust bearing and explain how it operates.



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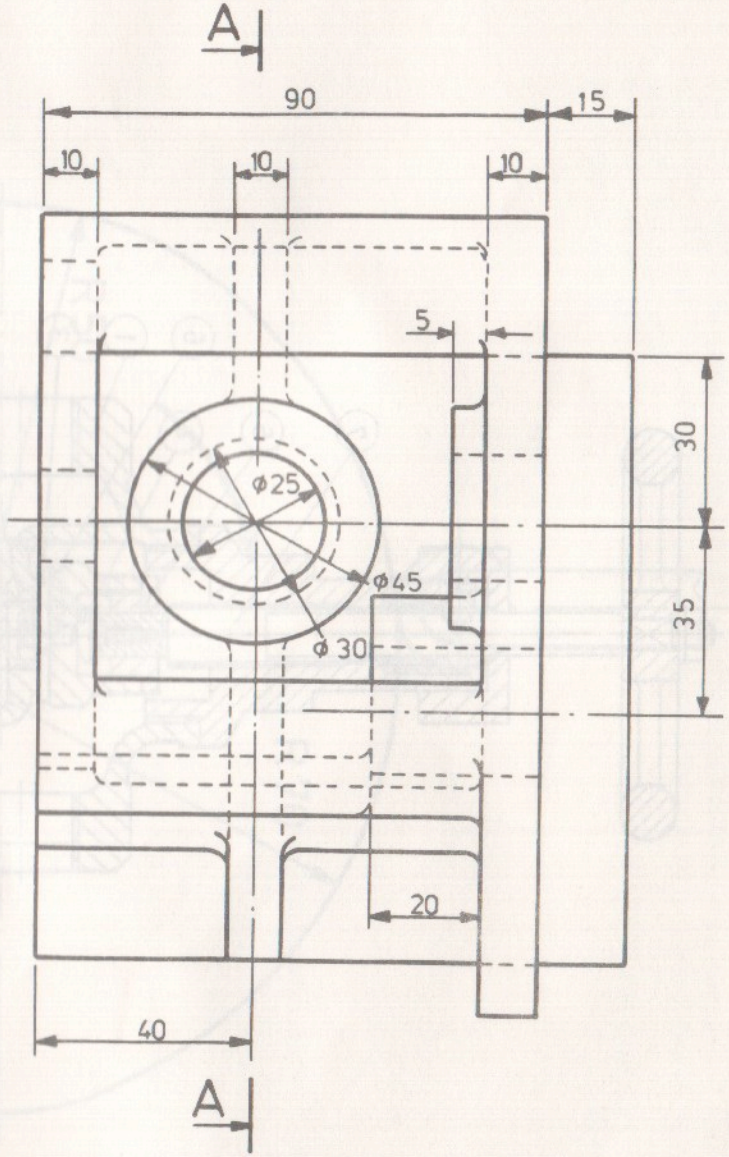
FÍOR 1. FIG. 1.



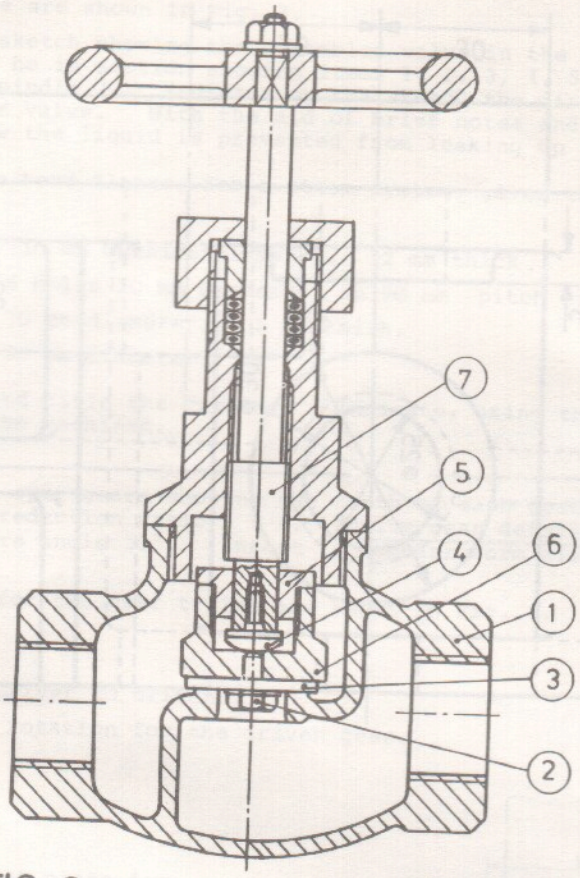


FIG. 3. FÍOR 3.

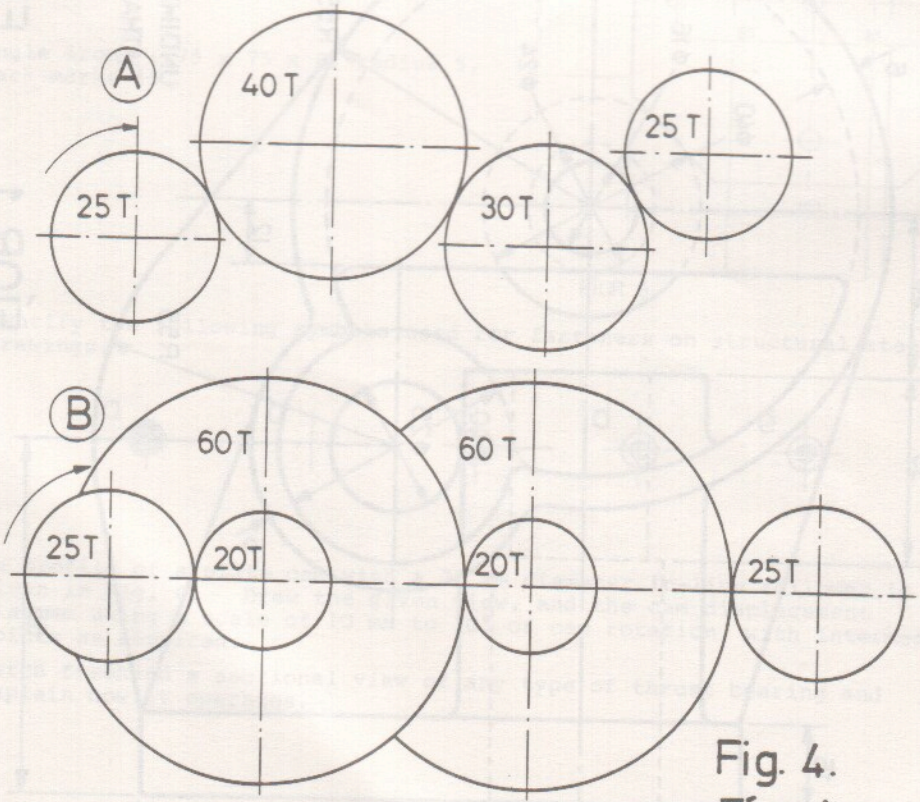
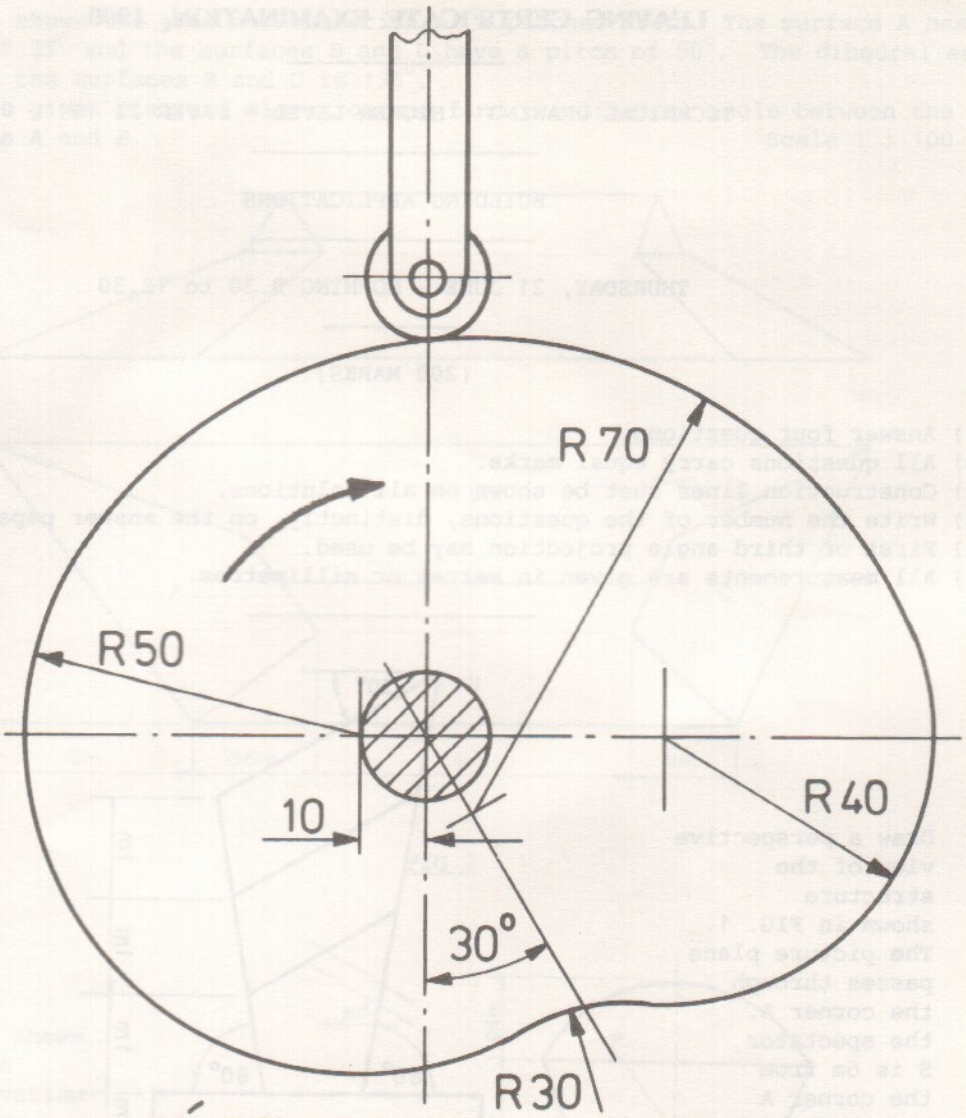


Fig. 4.
Fíor 4.



FÍOR 6. FIG. 6.