

**TECHNICAL DRAWING - ORDINARY LEVEL  
PAPER II (A) - ENGINEERING APPLICATIONS**  
200 marks

MONDAY, 19 JUNE - MORNING 9.30 to 12.30

**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.

1. Details of a HUB PULLER are given in Fig. 1 with a parts list tabulated below.

INDEX	PART	REQUIRED
1	BODY	1
2	PLUG	1
3	PIN	4
4	LEG	4

- (a) Make the following drawings of the assembly in first or third angle projection.
  - (i) A sectional elevation on section plane AA.
  - (ii) A plan projected from view (i).
- (b) Insert the following on the drawings:-
  - (i) Title:- HUB PULLER
  - (ii) ISO projection symbol.
  - (iii) Four leading dimensions.

(100 marks)

2. Fig. 2 shows an incomplete elevation and end view of the junction between an equilateral triangular duct and a circular pipe.

- Complete the given elevations.
- Draw the surface development of the circular pipe with the joint on the line AB.
- Develop the top surface of the triangular duct showing the true shape of the hole.
- Fig. 3 shows a type of joint and its weld symbol. By means of neat freehand sketches show pictorial illustrations of each joint.

(50 marks)

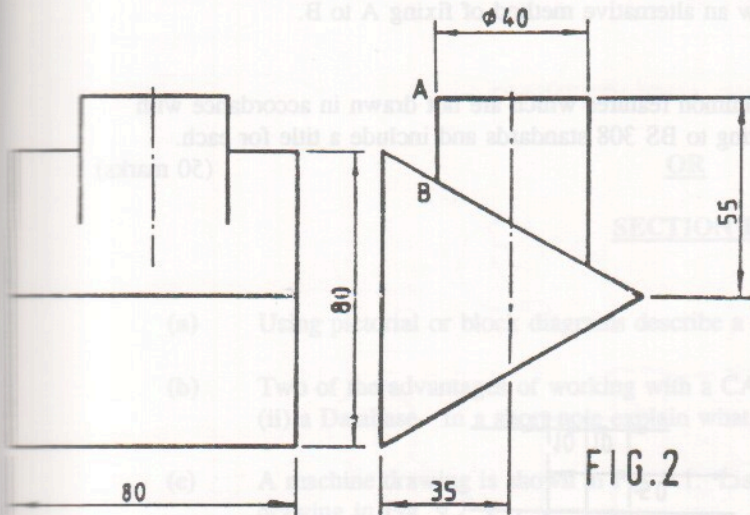


FIG. 2

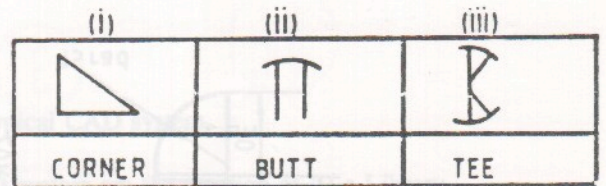


FIG. 3

3. (a) Draw a Radial Plate Cam with a minimum radius of 25 mm and clockwise rotation, to impart the following motion to an in-line knife edge follower.

- 0° - 45° Rise 30 mm with uniform velocity.
- 45° - 90° Dwell.
- 90° - 135° Rise 20 mm with uniform velocity.
- 135° - 180° Dwell.
- 180° - 360° Return to initial position with simple harmonic motion.

Include the displacement diagram as part of your solution.

(b) Fig. 4 shows a link mechanism. The rod PQ is connected to a pin joint at A and passes through a swivel guide at C. A is connected to a crank OA which rotates about O.

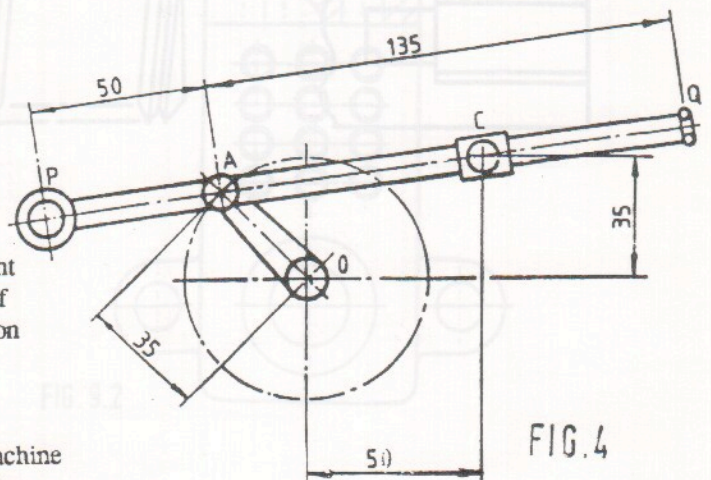


FIG. 4

- Using a line diagram to represent the mechanism, plot the locus of points P and Q for one revolution of OA.
- Draw the profile of a simple machine guard about the mechanism with a minimum clearance of 15 mm.

(50 marks)

4. (a) Fig. 5 shows a sectional elevation through a nylon bracket. It is incorrectly dimensioned. Assume all numerical values to be correct.
- (i) How many dimensions are shown correctly with reference to BS 308 ?
  - (ii) Using the dimensions given, produce a correctly dimensioned drawing of the bracket.
- (b) (i) Identify the machine part shown in Fig. 6.
- (ii) Name the parts 1, 2, 3, 4.
  - (iii) By means of a sketch show an alternative method of fixing A to B.
- (c) Fig. 7 shows a representation of common features which are not drawn in accordance with BS 308. Redraw each item according to BS 308 standards and include a title for each.
- (50 marks)

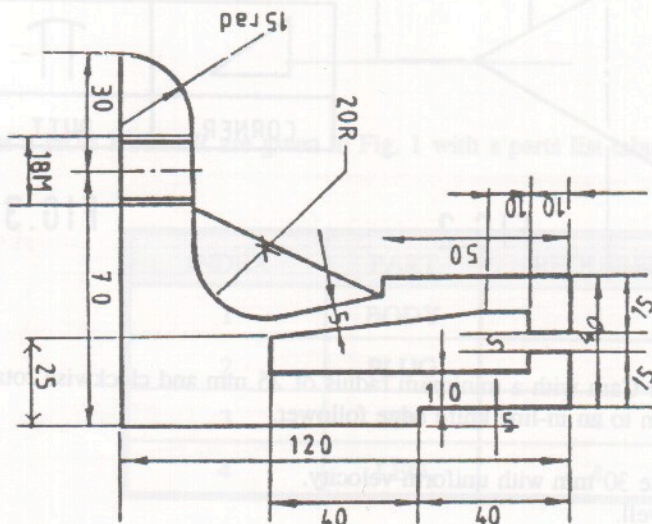


FIG. 5

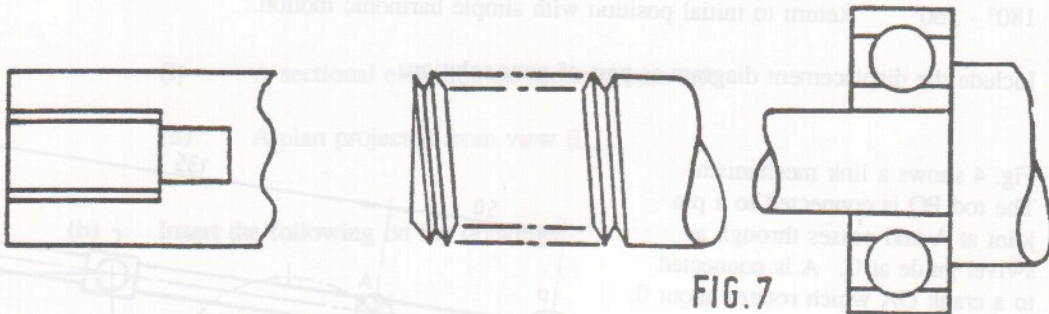


FIG. 7

5. Answer SECTION A OR SECTION B but not both.

**SECTION A**

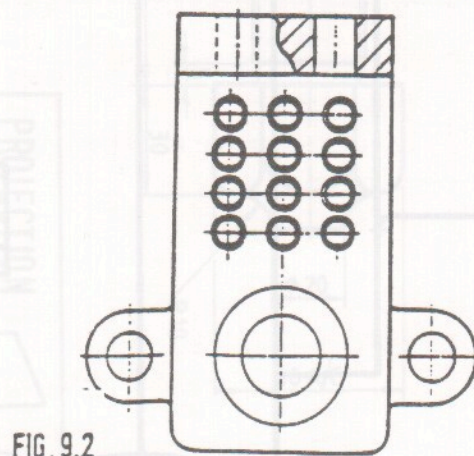
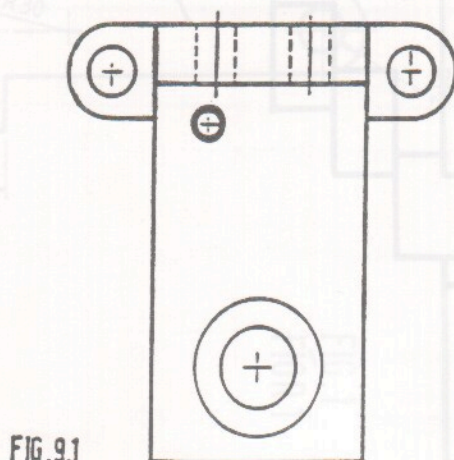
- (a) Fig. 8 shows two elevations of a machine casting. Draw an *isometric view* of the casting on section plane SS. Point P to be the lowest point of the view.
- (b) Make large neat freehand sketches of the following:-
- (i) An end cam. By means of arrows show the movement of the shaft and the follower.
  - (ii) A screw thread profile and indicate the following features:- Crest; Pitch; Flank.
  - (iii) A thrust bearing.

**OR**

**SECTION B**

- (a) Using pictorial or block diagrams describe a typical CAD system.
- (b) Two of the advantages of working with a CAD system are the creation of (i) a Library, (ii) a Database. In a short note explain what is meant by each term.
- (c) A machine drawing is shown in Fig. 9.1. List at least six commands necessary to complete the drawing in Fig. 9.2.
- (d) With the aid of a brief note explain the difference between (i) an Impact Printer, (ii) A non-Impact Printer.
- (e) By means of sketches and a short note, explain the purpose of the following commands:-
- (i) Zooming;
  - (ii) Fillets;
  - (iii) Rotation.

(50 marks)



LEAVING CERTIFICATE EXAMINATION

1995

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PAPER II(A)

ENGINEERING APPLICATIONS

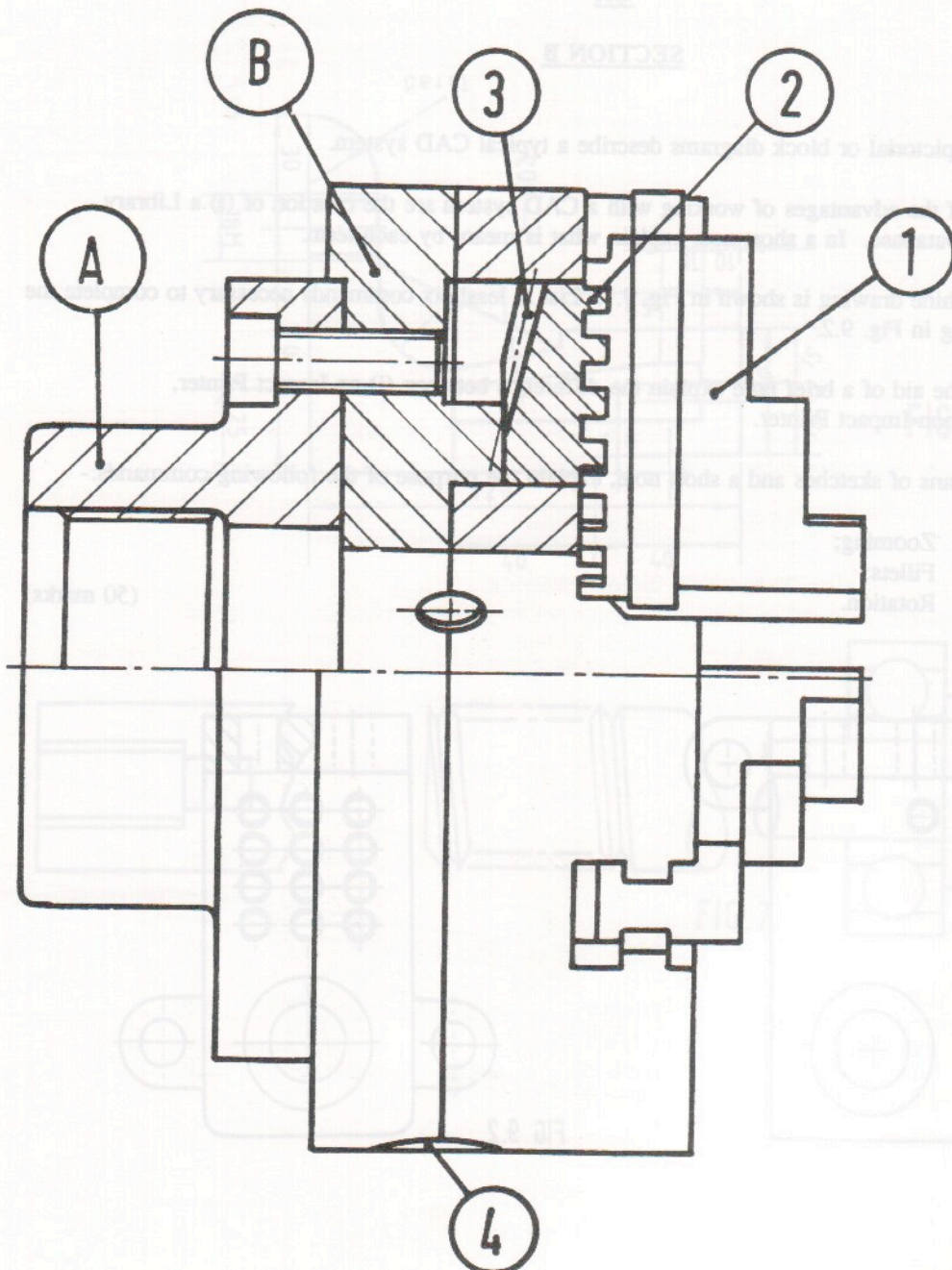


FIG. 6  
FÍOR 6

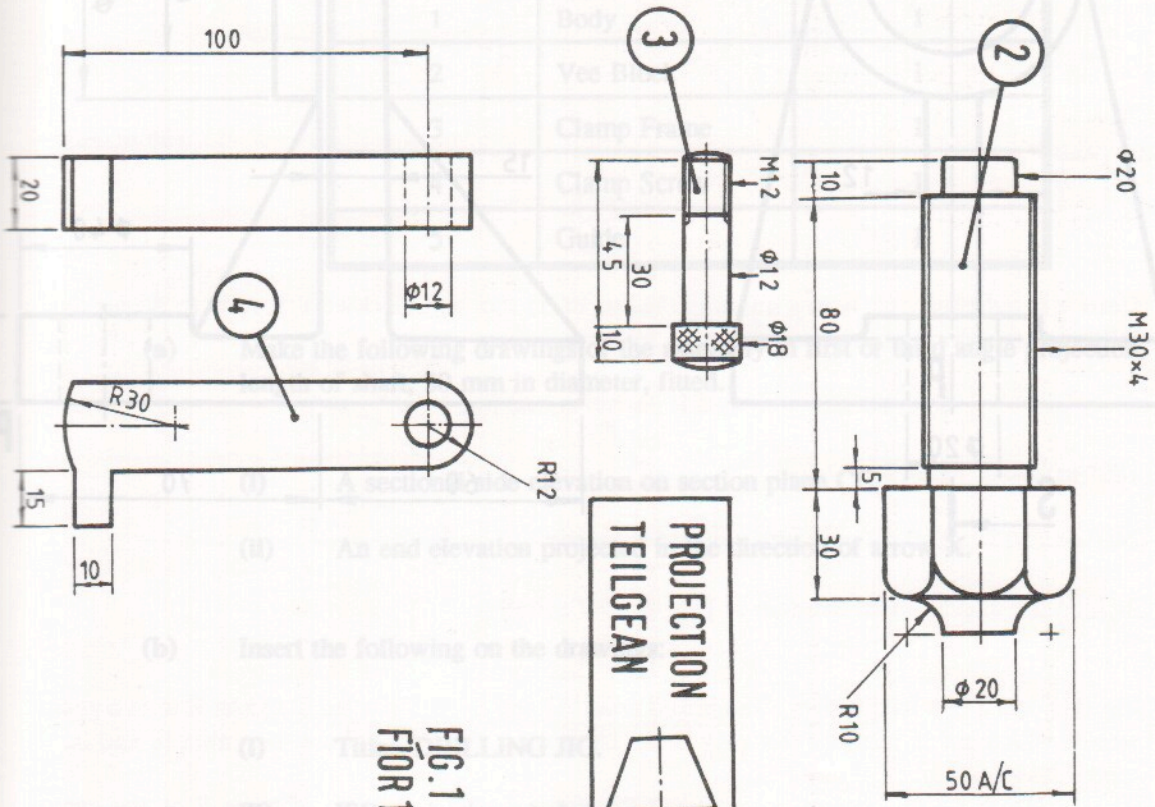
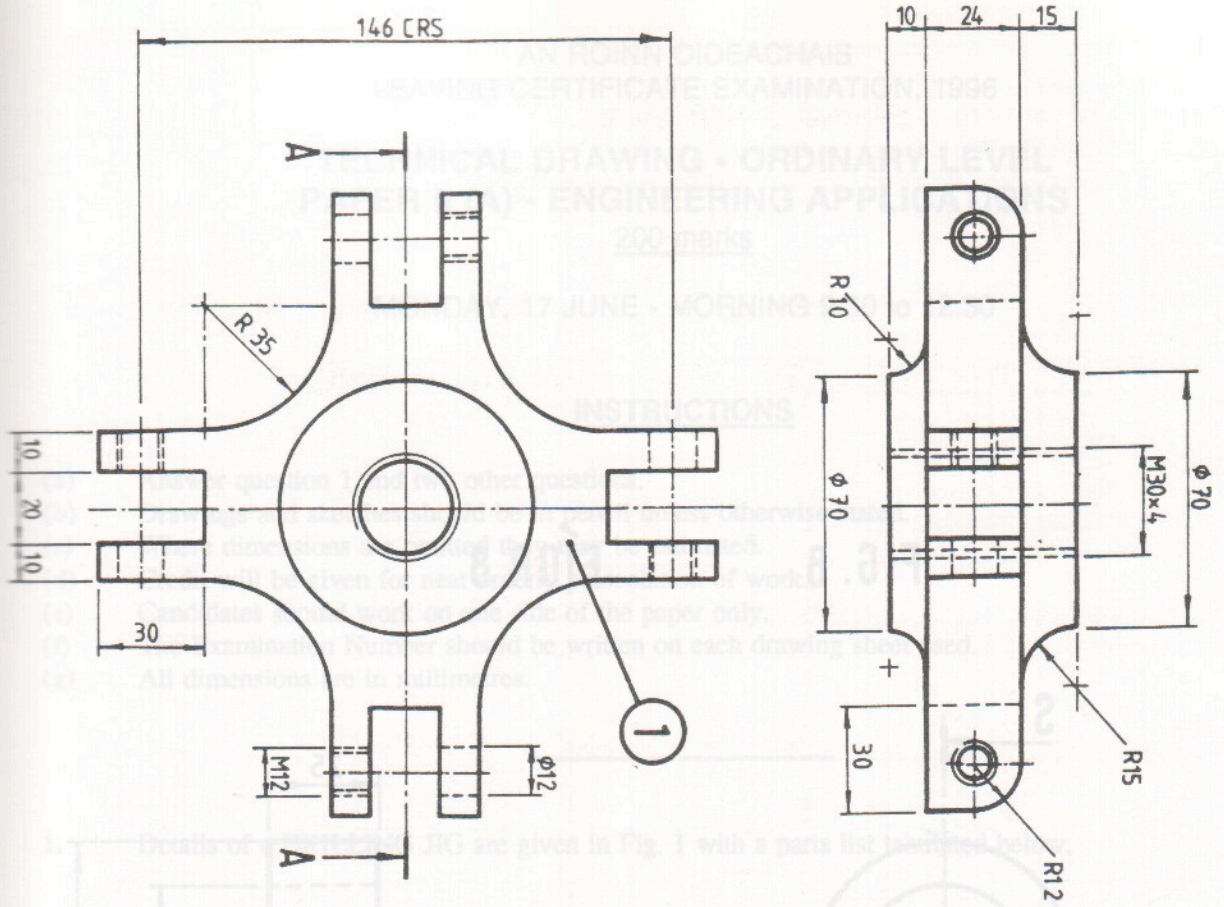
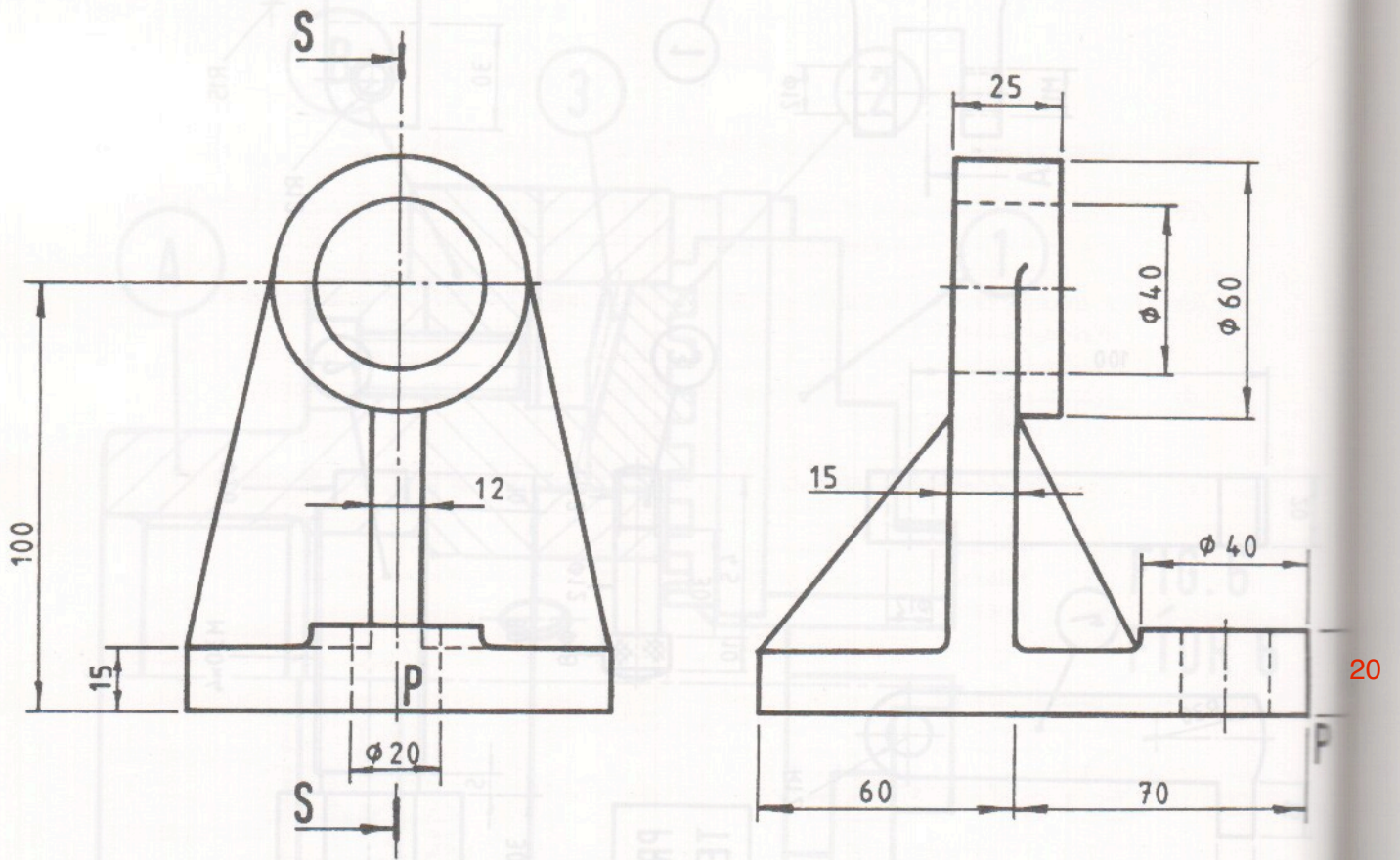


FIG.1  
FIGOR 1

FIG. 8

FÍOR 8



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