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LEAVING CERTIFICATE EXAMINATION, 1994 7258

M.82

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

200 marks

MONDAY, 20 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.

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1. Details of an CLAMPING UNIT are given in Fig. 1 with a parts list tabulated below.

INDEX	PART	REQUIRED
1	UPPER CLAMP CASTING	1
2	LOWER CLAMP CASTING	1
3	HINGE PIN	1
4	WASHER	1
5	CIRCLIP	1
6	BOLT	1
7	FLAT WASHER	1
8	NUT	1

(a) Make the following drawings of the assembled clamp in first or third angle projection, with a 150 mm length of shaft 60 mm in diameter fitted.

(i) A sectional side elevation on section plane XX.

(ii) An end elevation viewed in the direction of arrow Y.

(b) Insert the following on the drawing:-

(i) Title:- CLAMPING UNIT

(ii) ISO projection symbol.

(iii) Four leading dimensions.

(100 marks)

OVER→

2. A plan and incomplete elevation of two intersecting pipes are shown in Fig. 2.

(a) Draw both views and complete the elevation.

(b) Draw the surface development of both pipes so that the joint lines are along AB and CD.

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

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

(50 marks)

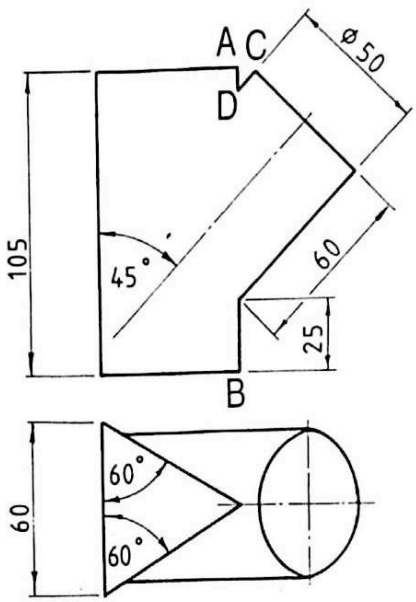


FIG.2

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

O° to 180° Rise 60 mm with uniform acceleration and retardation.

180° to 225° Fall 20 mm 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 four bar chain mechanism. Links BD and CE are pin-jointed at C. CD is an extension of BC.

(i) Using a line diagram to represent the mechanism, plot the locus of point D for one revolution of crank AB.

(ii) Draw the profile of a simple machine guard about the mechanism with a minimum clearance of 12 mm. (50 marks)

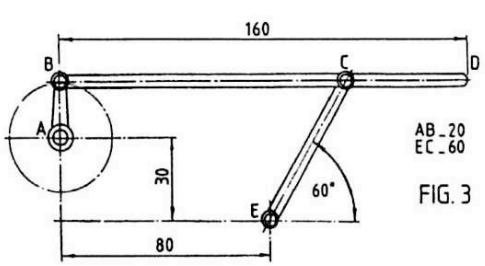


FIG. 3

4. (a) Fig. 4 shows an <u>incorrectly</u> dimensioned template. 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 template.

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

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

(iii) By means of a sketch show another method of fixing part A to Part B.

(c) With the aid of freehand sketches explain any <u>two</u> of the following engineering terms:

(i) Shoulder;

(ii) Hub;

(iii) Fillet. *(50 marks)*

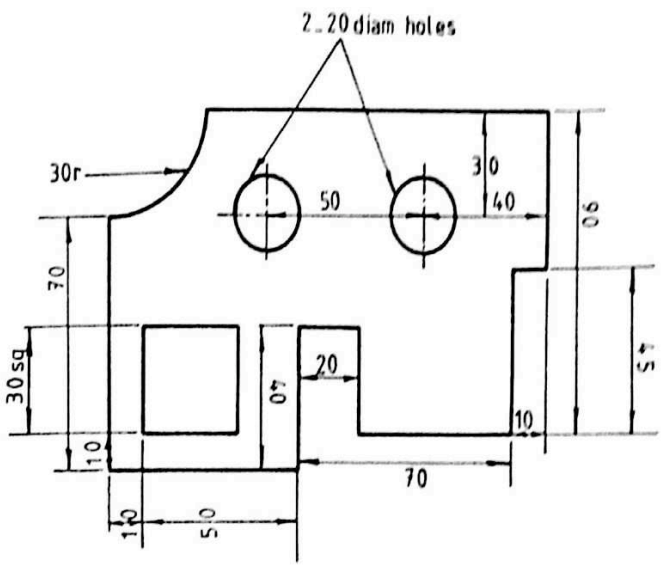


FIG. 4

OVER→

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

SECTION A

(a) Fig. 6 shows an elevation of a machine casting. Draw an isometric view of the casting, on section plane CC, with the front portion of the casting removed. P is to be the lowest point on the drawing.

(b) By means of large freehand sketches show the profiles of the following screw threads.

(i) Buttress;
(ii) Square;
(iii) Acme.

OR

SECTION B

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

(b) Name the three main precautions to be taken when working with floppy disks.

(c) Name two types of plotter.

(d) Which of the following would be the most suitable snap resolution for the drawing in Fig 6.2?

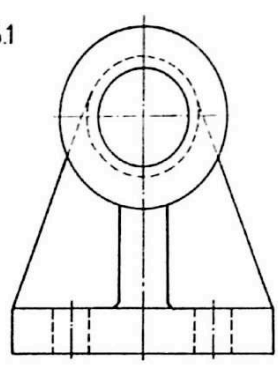
(i) 1.0 (ii) 0.5. (iii) 0.25 (iv) 0.1

(e) By means of sketches and a short note, explain the purpose of the following commands.

(i) Translating;
(ii) Mirroring;
(iii) Duplicating.

(50 marks)

FIG.6.1



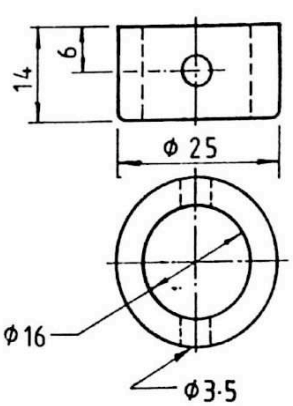


FIG.6.2

FIG. 1
FÍOR 1

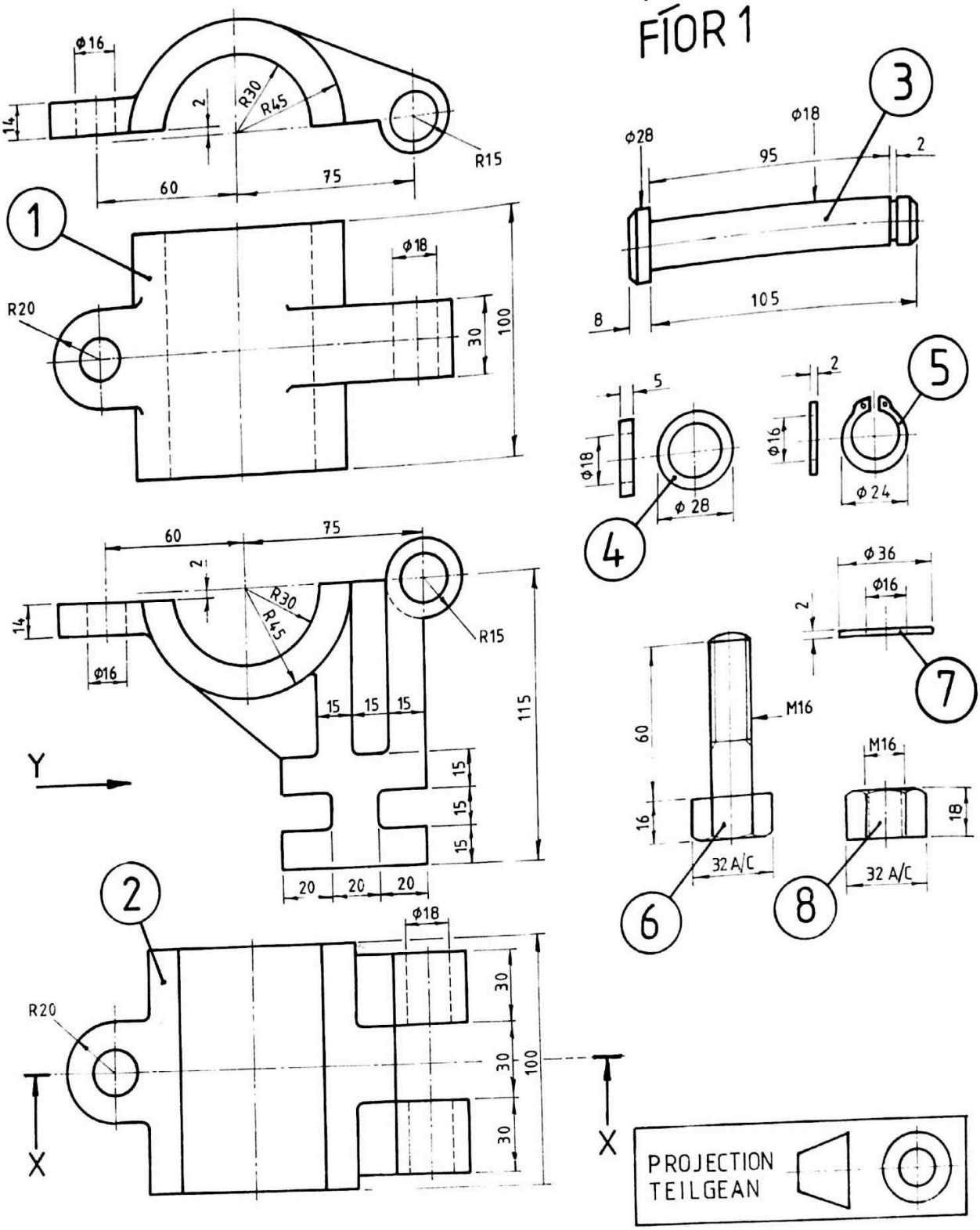

ϕ16
14
2
R30
R45
R15
60
75
1
ϕ18
R20
30
100
3
ϕ28
ϕ18
95
2
105
8
5
2
ϕ18
ϕ16
ϕ 28
ϕ 24
4
5
ϕ 36
ϕ16
2
7
M16
60
16
32 A/C
6
M16
18
32 A/C
8
60
75
2
R30
R45
R15
14
ϕ16
15
15
15
115
15
15
15
Y
20
20
20
2
ϕ18
R20
30
30
100
30
X
X
PROJECTION
TEILGEAN

FIG.5 FÍOR 5

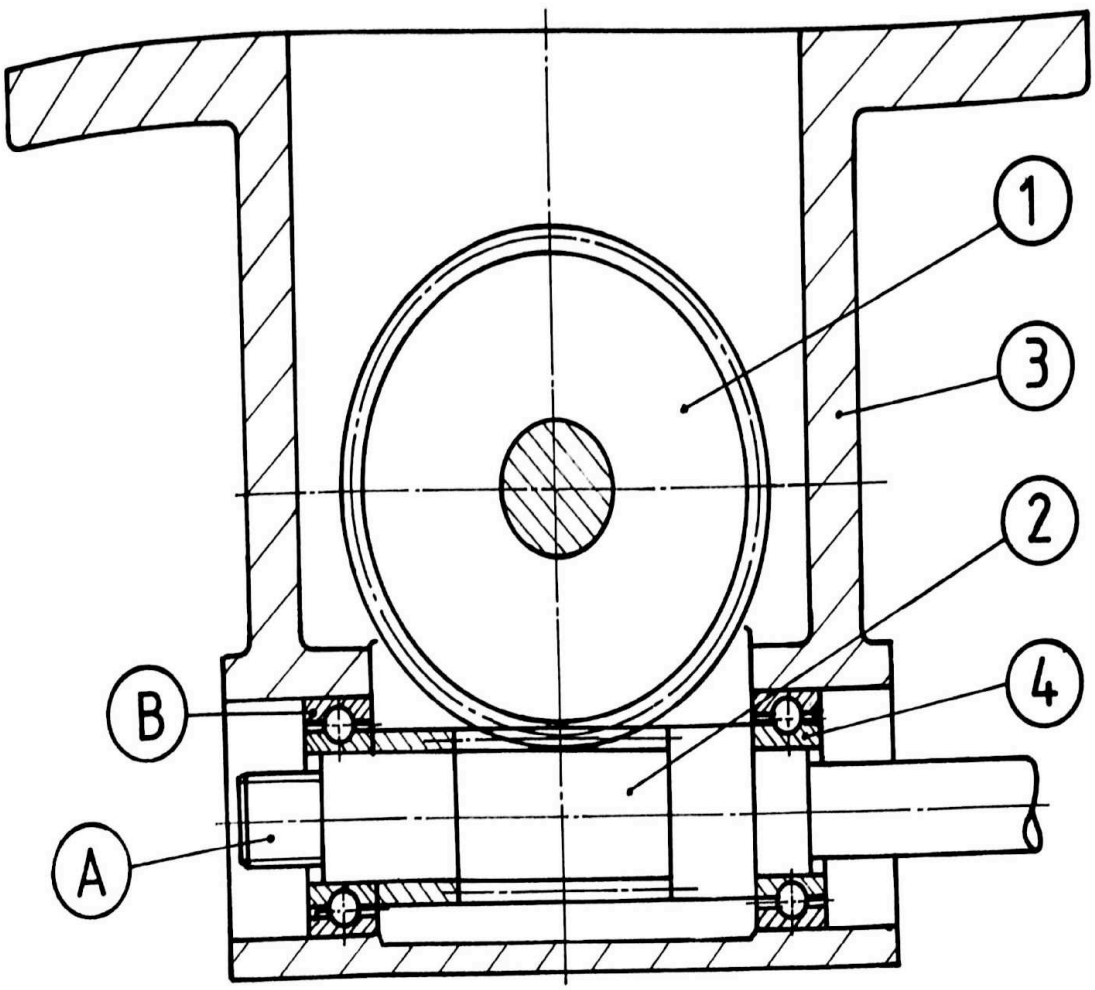


FIG. 6 FÍOR 6