AN ROINN OIDEACHAIS

M.82

6805

LEAVING CERTIFICATE EXAMINATION, 1993

TECHNICAL DRAWING - ORDINARY LEVEL

PAPER II (A) - ENGINEERING APPLICATIONS

200 marks

MONDAY, 21st 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 ECCENTRIC TOOL REST for woodturning are given in Fig. 1 with a parts list tabulated below.

INDEX	PART	REQUIRED
1	BODY	1
2	REST	1
3	CLAMP	1
4	ECCENTRIC	1
5	LOCKNUT	2

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

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

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

(b) Insert the following on the drawings:-

(i) Title:- ECCENTRIC TOOL REST

(ii) ISO projection symbol.

(iii) Four leading dimensions. **(100 marks)**

OVER→

2. Two incomplete elevations of the joint between a cylindrical and a triangular pipe are shown in Fig. 2.

(a) Draw and complete the two elevations.

(b) Project a plan from the side elevation.

(c) Draw the surface development of the triangular pipe.

(d) Draw the true shape of the hole in the cylinder.

(e) Make a neat freehand sketch of an OGEE BEAD as used in sheet metalwork.

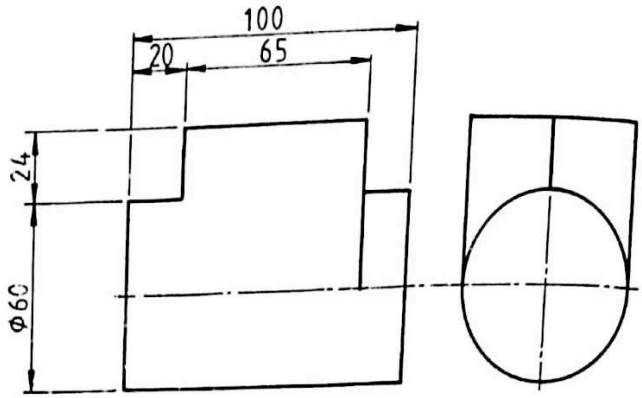

FIG. 2 FÍOR 2

(50 marks)

3. **(a)** A radial plate cam rotates clockwise at 20 revolutions per minute and operates an in-line knife edge follower. The nearest approach of the follower to the cam centre is 35 mm. Draw the profile of the cam which will impart the following motion to the follower:

Rise 48 mm with uniform velocity, 0 to 1 second.
Dwell, 1 to 1.5 seconds.
Return to initial position with uniform acceleration and retardation, 1.5 to 3 seconds.
Include the displacement diagram as part of the solution.

(b) Fig. 3 shows a four-bar chain mechanism.

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

(ii) Draw the profile of a simple machine guard about the mechanism with a minimum clearance of 15 mm.

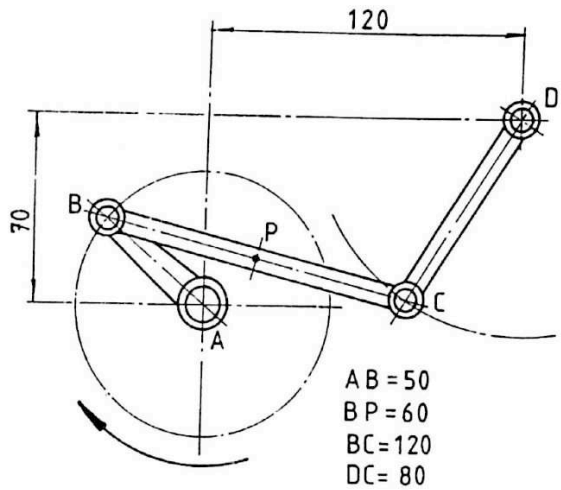

FIG. 3
FÍOR 3

(50 marks)

4. (a) Using the data table below, make a fully dimensioned drawing, showing all specifications, of the machine part in Fig. 4. Use edge EE as a datum.

1	Screwthread; Metric 40, Pitch 3.5, Length 35.
2	Undercut: Depth 5, Length 5.
3	Maximum Diameter 60, Minimum Diameter 40, Length 50, Woodruff Keyway ϕ 40 and Depth 8 mid length.
4	Length 40, Diameter 60.
5	Length 20, Diameter 80, Chamfer 5 x 45°, Finish Straight Knurl.
6	Sphere Diameter 70

(b) (i) Identify the assembly shown in Fig. 5.

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

(iii) Name the gearing arrangement between parts A and B.

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

(i) Blind Hole.

(ii) Bore.

(iii) Slot.

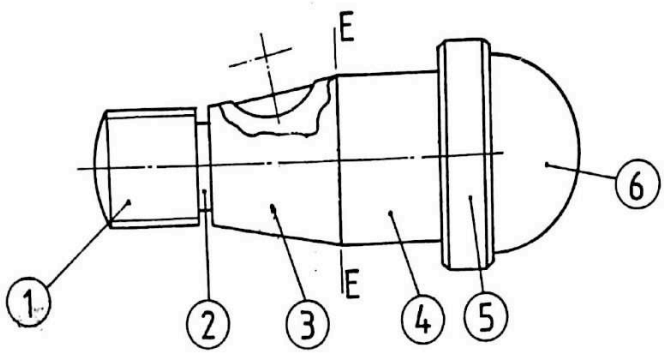

FIG. 4 FIOR 4

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

SECTION A

(a) Fig. 6 shows two elevations of a machine casting. Draw an isometric view of the casting, viewed in the direction of arrow *P*, with the portion above section plane S-S removed.

(b) By means of large freehand sketches show the following structural steel sections:

(i) Tee Section.
(ii) Channel Section.
(iii) Unequal Leg Angle.

OR

SECTION B

(a) Complete the following table on your drawing sheet. The first answer has been entered for guidance.

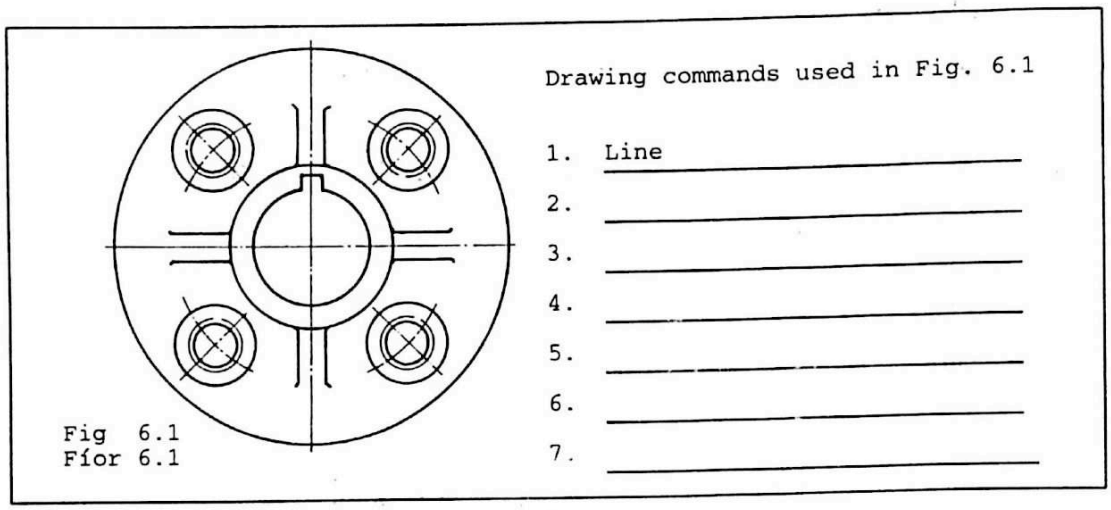

Fig 6.1
Fíor 6.1

(b) Name three types of OUTPUT device used in CAD.

(c)

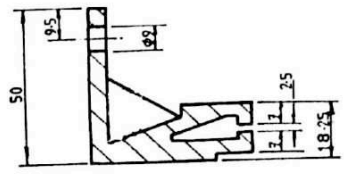

FIG.6.2 FÍOR 6.2

Which of the following would be the MOST suitable snap resolution for the drawing in Fig. 6.2 ?

(i) 0.05 **(ii)** 0.25
(iii) 0.2 **(iv)** 1.

(d) By means of sketches explain the purpose of the following commands.

(i) Array. (ii) Stretch. (iii) Block.

ANSWERS TO BE GIVEN ON DRAWING SHEET.

(50 marks)

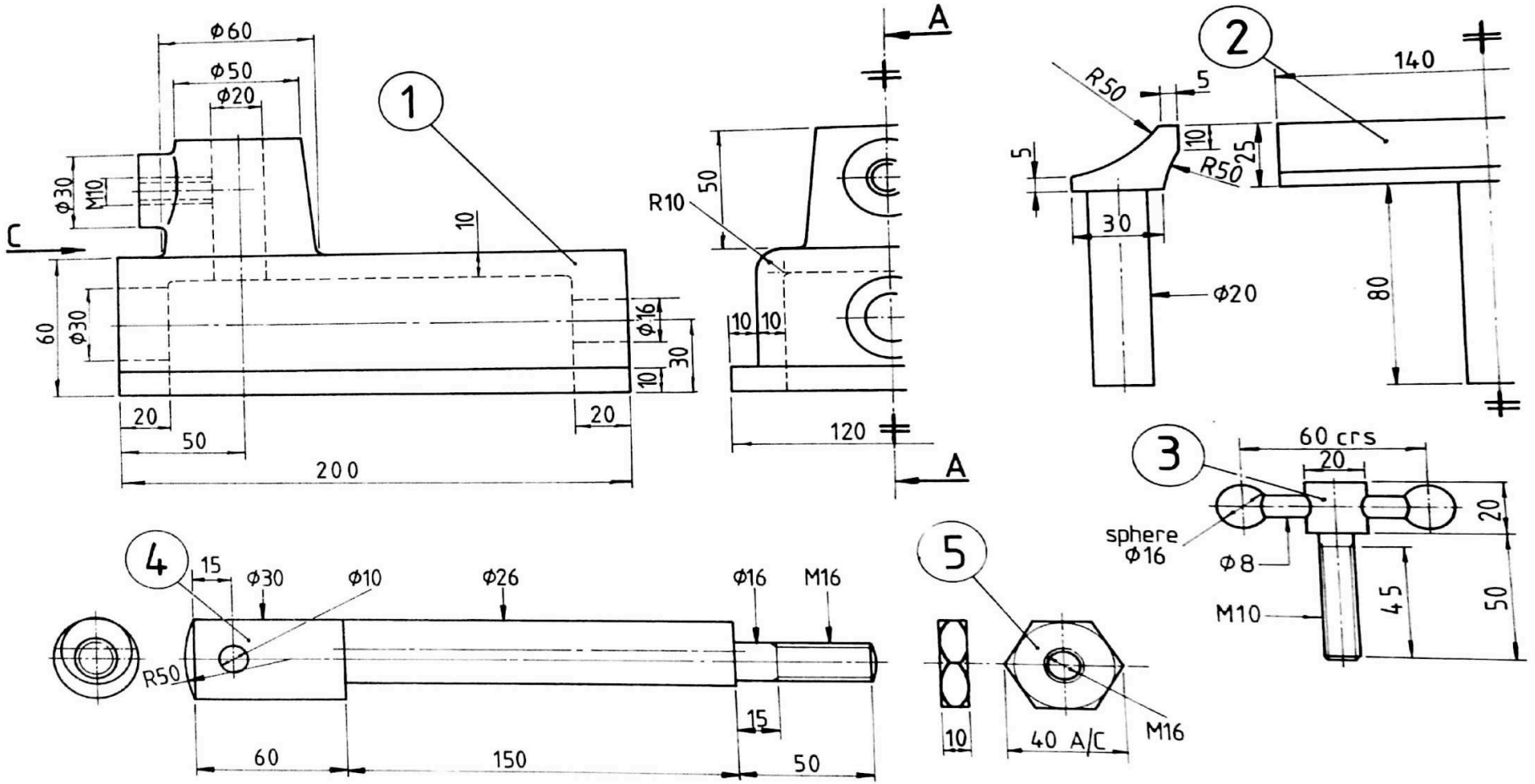
1
2
3
4
5
A
A
C
Φ60
Φ50
Φ20
Φ30
M10
10
60
Φ30
Φ16
30
10
20
50
200
20
R10
50
10
10
120
R50
5
10
25
5
R50
140
30
Φ20
80
60 crs
20
20
sphere
Φ16
Φ8
M10
45
50
15
Φ30
Φ10
Φ26
Φ16
M16
R50
15
60
150
50
10
40 A/C
M16
PROJECTION
TEILGEAN

FIG.1 FÍOR 1

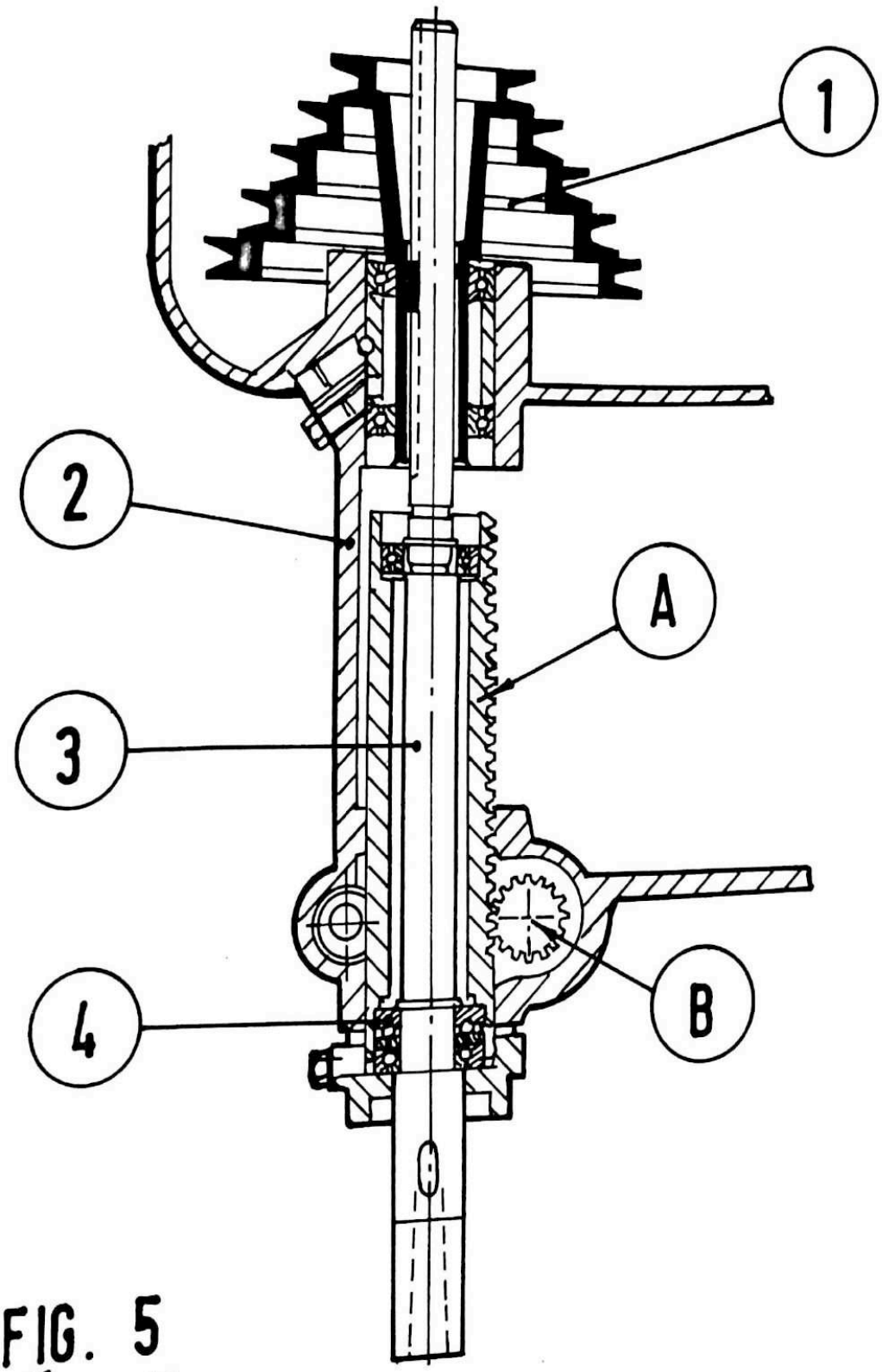

FIG. 5
FÍOR 5

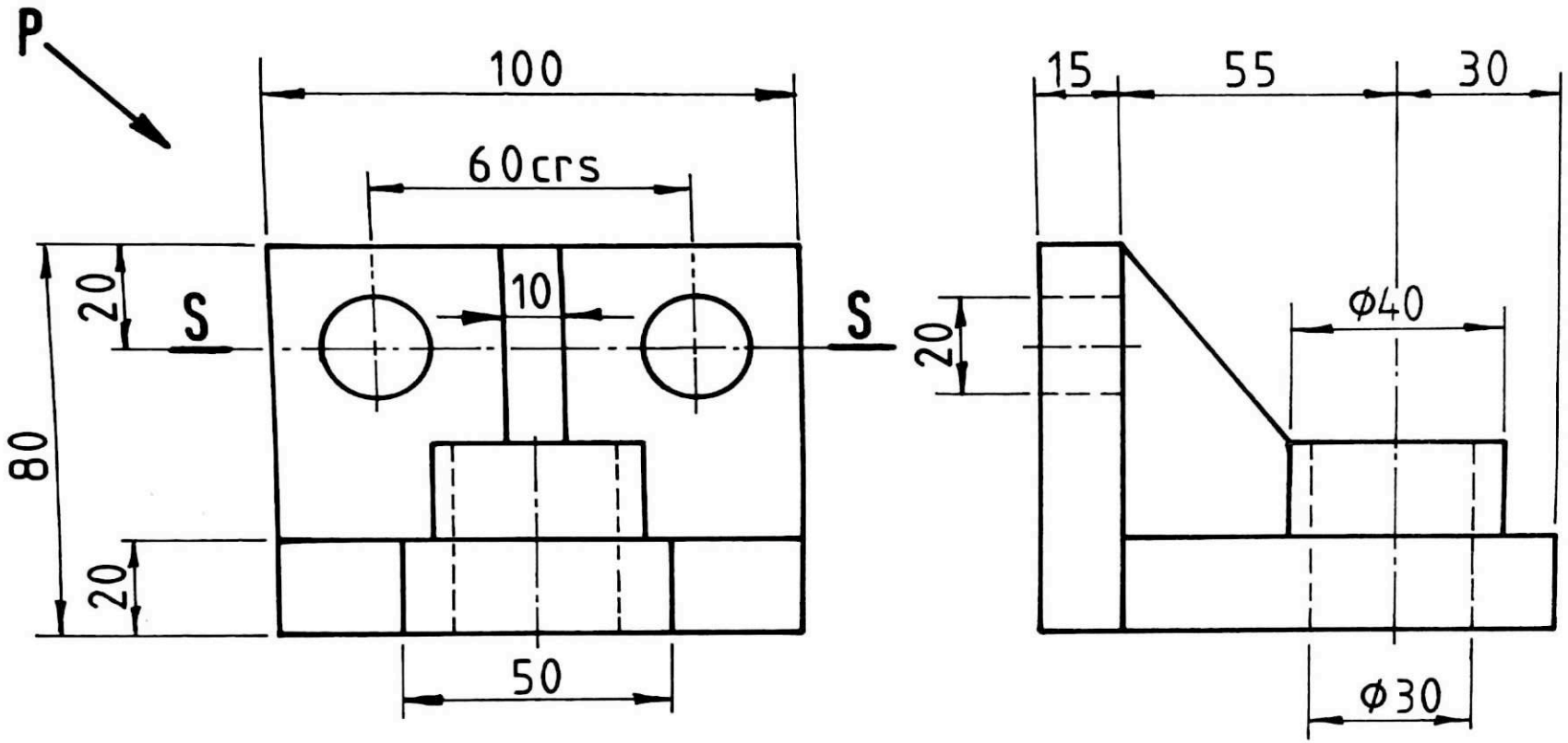

FIG. 6 FIOR 6