AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

SCRÚDÚ ARDTEISTIMÉIREACHTA

1999

LÍNÍOCHT THEICNIÚIL - GNÁTHLEIBHÉAL

PÁIPÉAR II(A)

FEIDHMIÚCHÁIN INNEALTÓIREACHTA

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION

1999

TECHNICAL DRAWING - ORDINARY LEVEL

PAPER II(A)

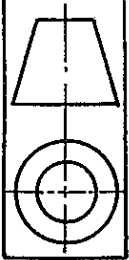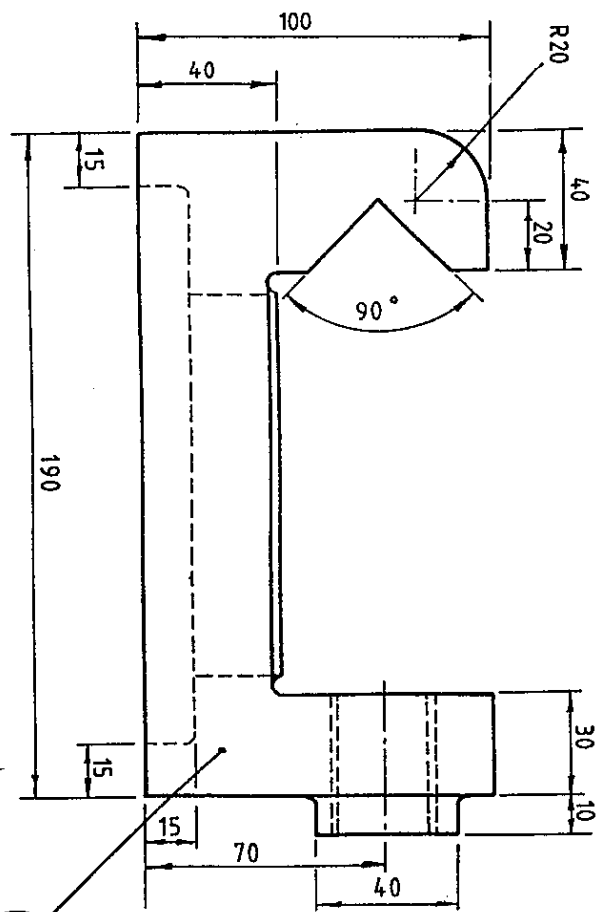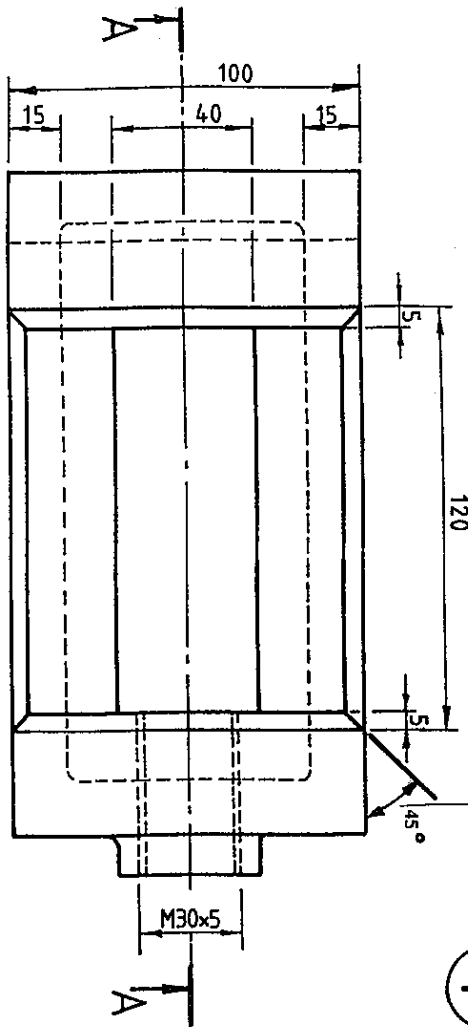## ENGINEERING APPLICATIONS

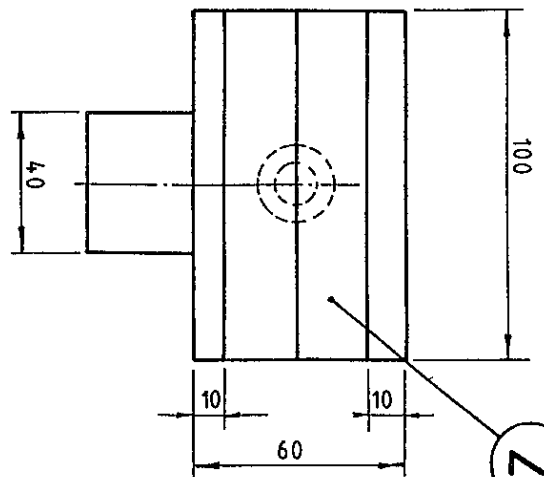PROJECTION
TEILGEAN

FIG.1

FÍOR1
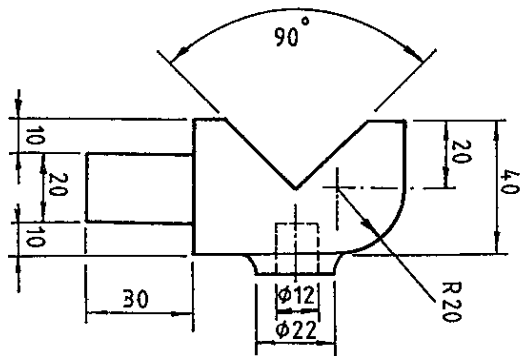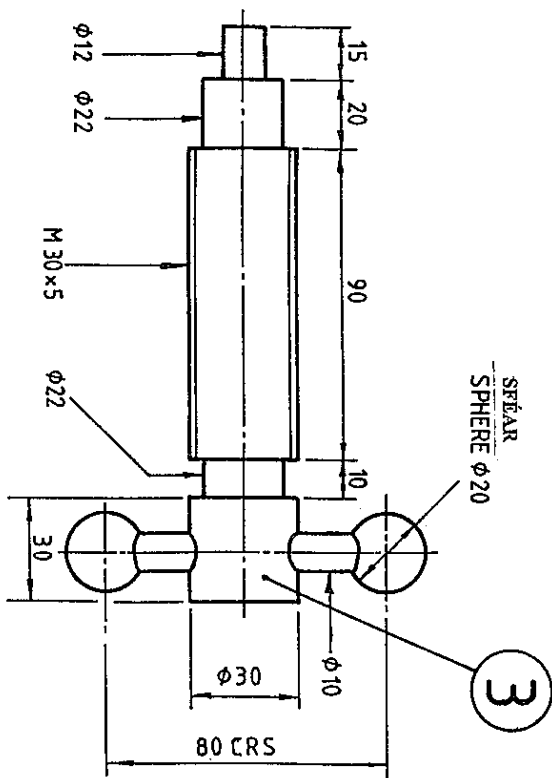
A

100
15 40 15

120

190

5

5
45°

M30x5

A

R20
40
20
90°

15
30
10

15
70
40
15

① ② ③

φ12
φ22
M30x5
φ22

15
20
90
10

30
φ30
φ10
80 CRS

SFÉAR
SPHERE φ20

90°
10
20
20
10
30
φ12
φ22
R20
40
20

100
40
40
10
60
10

FIG.3   FÍOR 3

R D —— 80
D A —— 140
O A —— 50
A P —— 90

FIG.5   FÍOR 5

FIG. 7.1
FÍOR 7.1

φ 20

7

10

φ 60

1.5×45°

5

M15x3

M.82

S180

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

200 marks

FRIDAY, 18 JUNE - AFTERNOON 2.00 p.m. - 5.00 p.m.

INSTRUCTIONS

(a) Answer question 1 and two other questions.
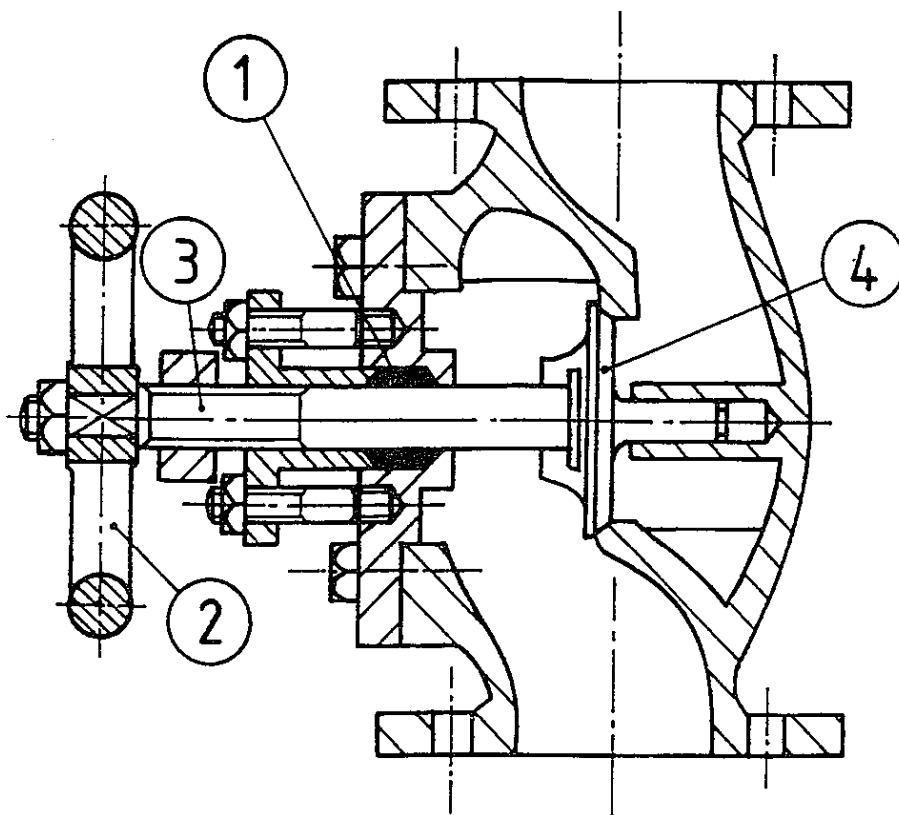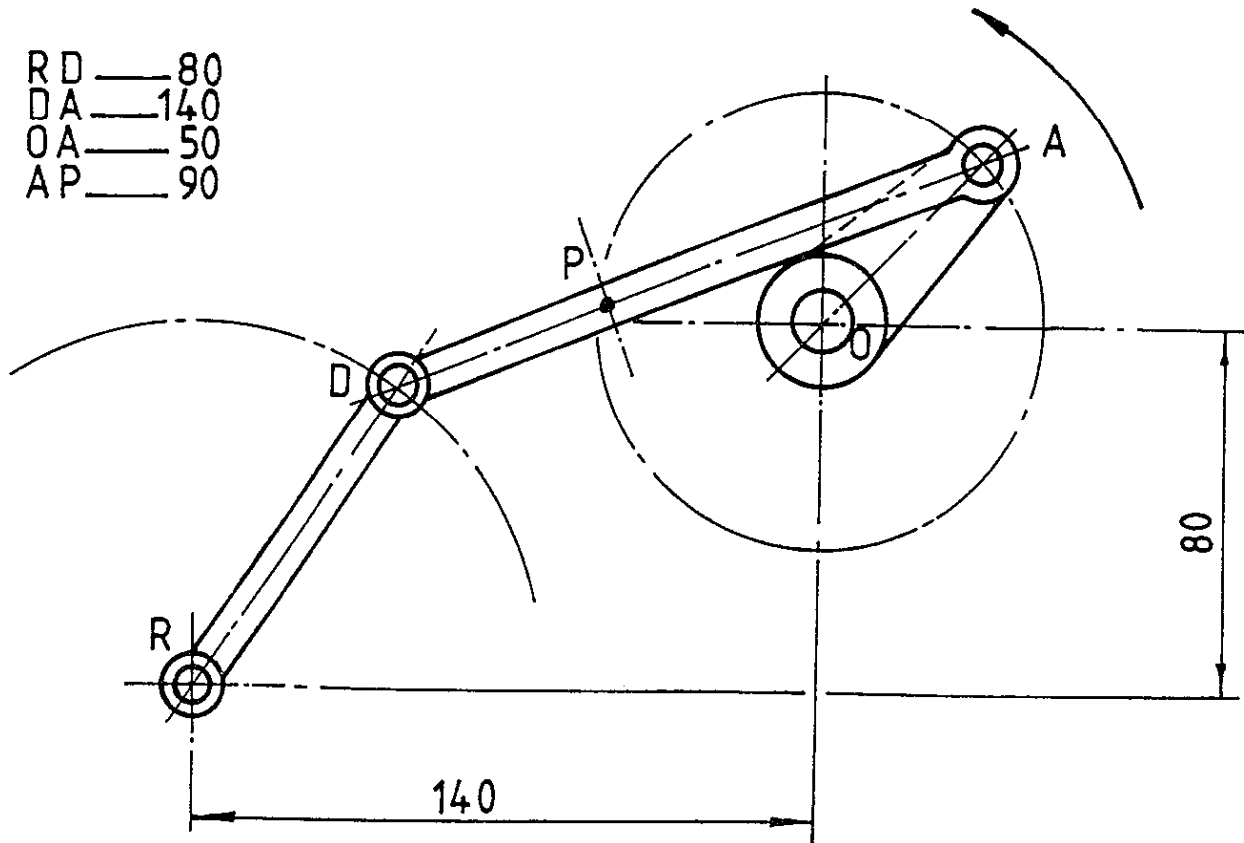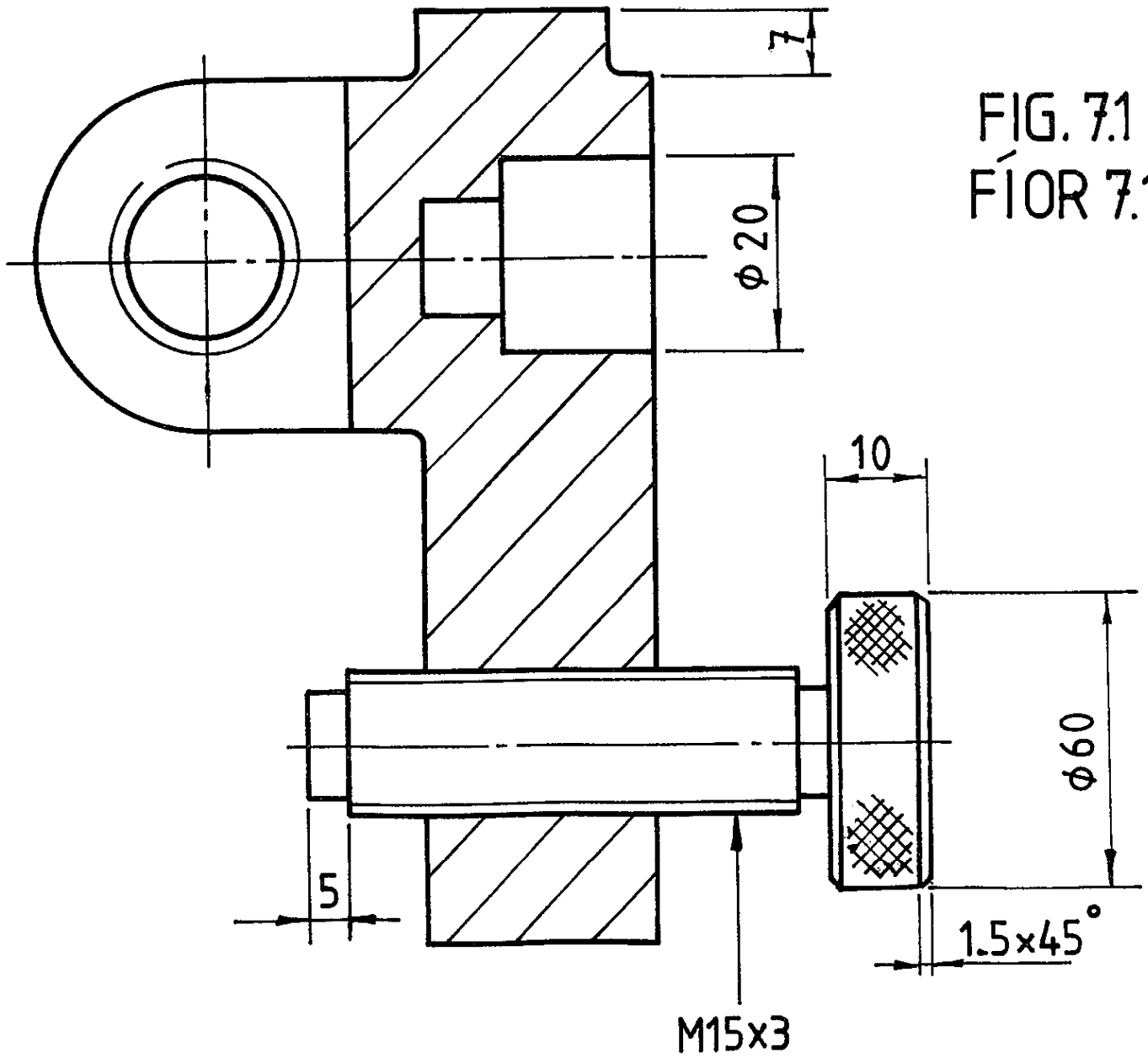(b) Drawings and sketches should be in pencil unless otherwise stated.
(c) Where dimensions are omitted they may be estimated.
(d) Credit will be given for neat orderly presentation of work.
(e) Candidates should work on one side of the paper only.
(f) The Examination Number should be written on each drawing sheet used.
(g) All dimensions are in millimetres.

---

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

| INDEX	PART	REQUIRED
1	Body	1
2	Movable jaw	1
3	Screw	1

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

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

    (ii) A half plan projected from (i).

(b) Insert the following on the drawings:

    (i) Title:- HANDVICE

    (ii) ISO projection symbol.

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

OVER→

2.   Fig. 2 shows the elevation of a roof ventilator made by cutting a right cone as shown, and having the seam at C-C.

(a)   Draw the elevation as shown.

(b)   Project a plan from view (a).

(c)   Draw the surface development of the ventilator.

(d)   Name and make a large freehand sketch of a suitable joint for the seam.

Fig. 2.
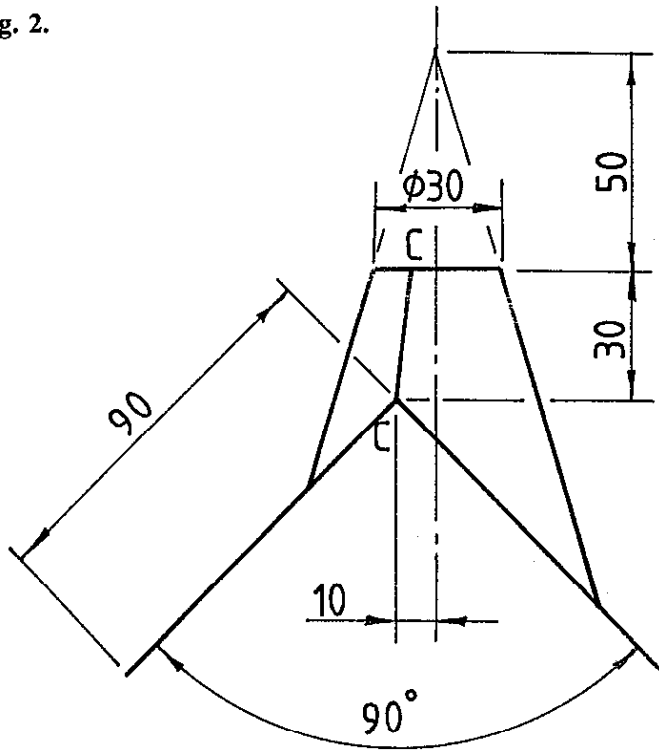
(50 marks)

3.   (a)   A radial plate cam rotates clockwise at 60 revolutions per minute and operates an in-line knife edge follower. The nearest approach of the follower to the cam centre is 40mm. Draw the profile of the cam to give the following motion to the follower:-

Rise 50mm with uniform velocity for 0.25 secs.

Dwell for 0.25 secs.

Return to initial position with simple harmonic motion for 0.5 secs.

Include the displacement diagram as part of your solution.

(b)   A four bar chain mechanism is shown in Fig. 3. Crank OA rotates in an anticlockwise direction.

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

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

(50 marks)

4. **(a)** Using the data table below, make a fully dimensioned drawing of the machine part shown in Fig. 4. Use SS as a datum.

1	Hexagonal head; 80 across corner, 30 deep.
2	Shaft, Diameter 60, Length 50.
3	Taper; Minimum diameter 30, Maximum diameter 60, Length 65.
4	Undercut; Depth 5, Length 5.
5	Screwthread; Metric 30, Pitch 3.5, Length 40.

Fig. 4
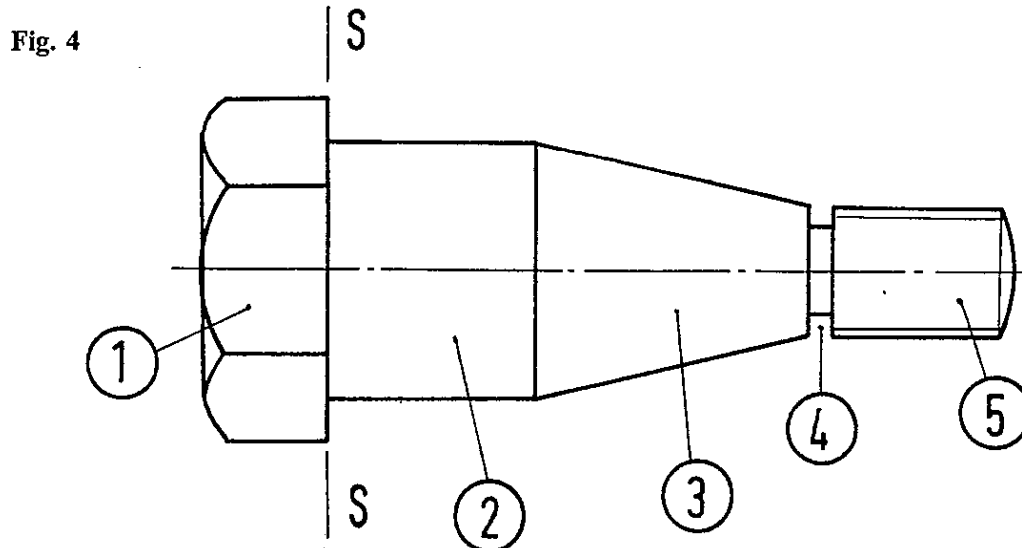
**(b)** Identify the assembly shown in Fig. 5.

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

(ii) Make a freehand sketch showing another method for fixing part 2 to part 3.

(c) Fig. 6 shows a drawing of an engineering assembly with various numbered parts depicted using conventional symbols. copy the chart shown on your answer sheet and identify each part by inserting the appropriate number in the left-hand column.

Fig. 6

| No.	Conventional Feature
	Centre Line
	Screw Thread
	Flat on shaft
	Bush
	Pulley
	Circlip
	Bearing
	Square shaft
	Shoulder
	Housing
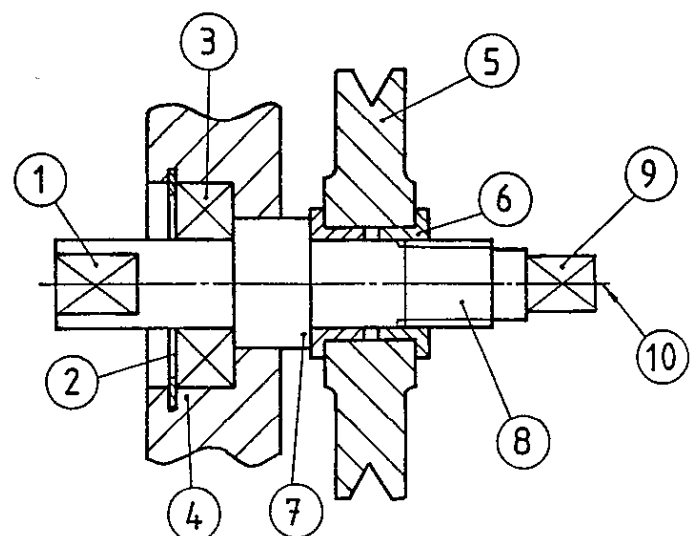
(50 marks)

OVER→

5.   Answer SECTION A **or** SECTION B but not both.

SECTION A

(a)   A right-hand, helical, single start screw thread, to the form shown in Fig. 7 is to be cut on a bar of diameter 120mm. Draw two revolutions of the screwthread, pitch 60mm.

(b)   With the aid of freehand sketches, explain the following abbreviations:-

(i)   CSK HD.
(ii)   CRS.
(iii)   C'Bore.

Fig. 7
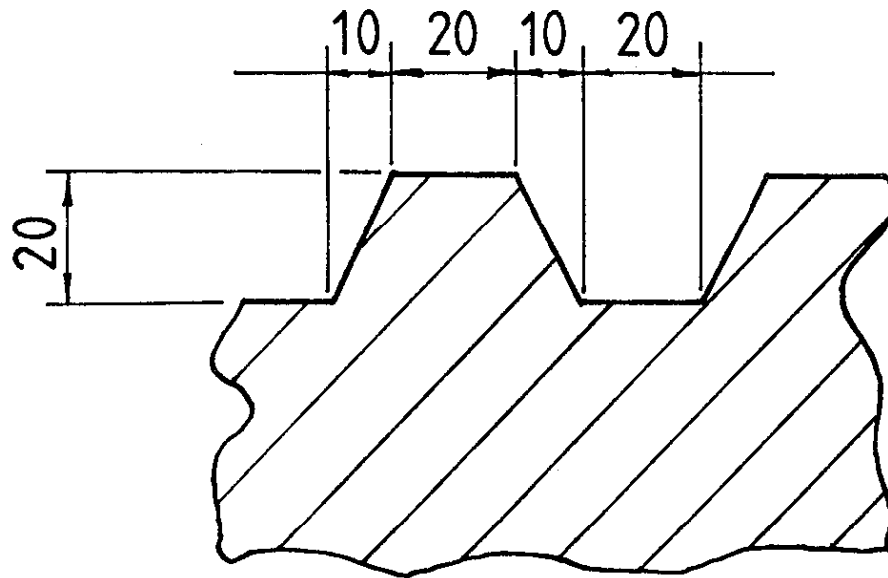
OR

SECTION B

(a)   List a selection of six commands necessary to produce the drawing shown in Fig. 7.1.

(b)   What would be the most suitable snap resolution to make the drawing in Fig. 7.1.

(c)   With the aid of a sketch and a short note, explain what is meant by incremental programming.

(d)   Name three types of Input Device used in computer aided drawing (CAD).

(e)   With the aid of a sketch and a short note explain the following functions used in CAD systems.

(i)   Mirroring;
(ii)   Zooming;
(iii)   Fillets.

(50 marks)