LEAVING CERTIFICATE EXAMINATION, 1987

TECHNICAL DRAWING - ORDINARY LEVEL

PAPER II (A) - ENGINEERING APPLICATIONS

200 Marks

FRIDAY, 26 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 dimessions are in millimetres.

1. Details of a Universal Joint are given in Fig. 1 with the parts list tabulated below.

INDEX	PART	REQUIRED
1	Fork	1
2	Flange	1
3	Centre	1
4	Pin	2
5	Collar	2

(a) Make the following drawings of the assembled parts in first or third angle projection:

(i) A sectional front elevation on section plane AA.
(ii) An end elevation viewed in the direction of arrow B.

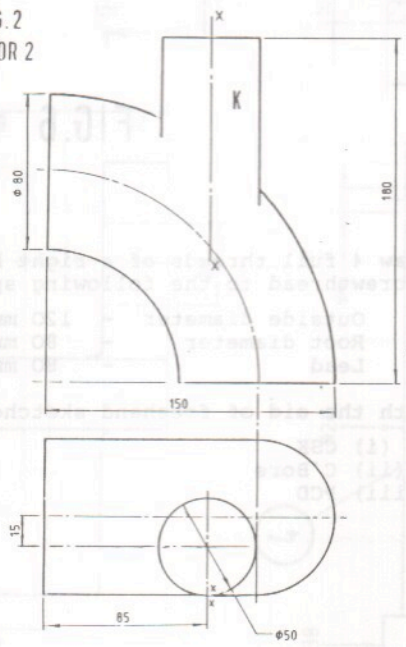
(b) Insert the following on the drawing:

(i) Title: UNIVERSAL JOINT.
(ii) ISO projection symbol.
(iii) Four leading dimensions.

(100 marks)

2. Fig. 2 shows the plan and incomplete elevation of a curved duct mounted by an offset cylinder.

FIG. 2
FIOR 2



(a) Draw the plan and complete the elevation.

(b) Draw the surface development of the pipe K using XX as the seam.

(c) Make a large sketch of an external grooved joint.

(50 marks)

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

0° to 90°	Rise 50 mm with uniform velocity
90° to 120°	Dwell
120° to 330°	Fall 50 mm with simple harmonic motion
330° to 360°	Dwell

Include the displacement diagram as part of the solution.

(b) Fig. 3 shows a textile machine mechanism. The crank AB is joined by a pin joint to the rod BE at B. BE is joined by a pin joint to the link CD at D.

Using a simple line drawing to represent the linkage:-

(i) Plot the locus of point E for one revolution of the crank AB.
(ii) Design and draw the profile of a simple guard about the mechanism with a minimum clearance of 10 mm.

(50 marks)

4. (a) Using the data table below, make a fully dimensioned drawing of the machine part in Fig. 4.

1	Screwthread:	Metric 60, Pitch 5.5, Length 50
2	Diameter 40,	Length 12
3	Diameter 52,	Length 30
4	Undercut 8 x 8	
5	Taper: Length 60,	Maximum diameter 48 Minimum diameter 20

(b) (i) Identify the gear drive shown in Fig. 5.

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

(iii) Make a neat freehand sketch showing a method used to lock A to B.

(c) Identify the standard pipe fittings (i), (ii) and (iii) shown by means of symbolic representation in Fig. 6.

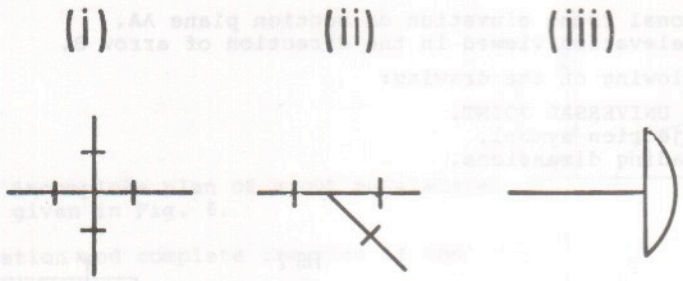


FIG.6 FIOR 6

(50 marks)

5. (a) Draw 4 full threads of a right hand square section, double start screwthread to the following specifications:-

Outside diameter	-	120 mm
Root diameter	-	80 mm
Lead	-	80 mm

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

(i) CSK
(ii) C'Bore
(iii) PCD

(50 marks)

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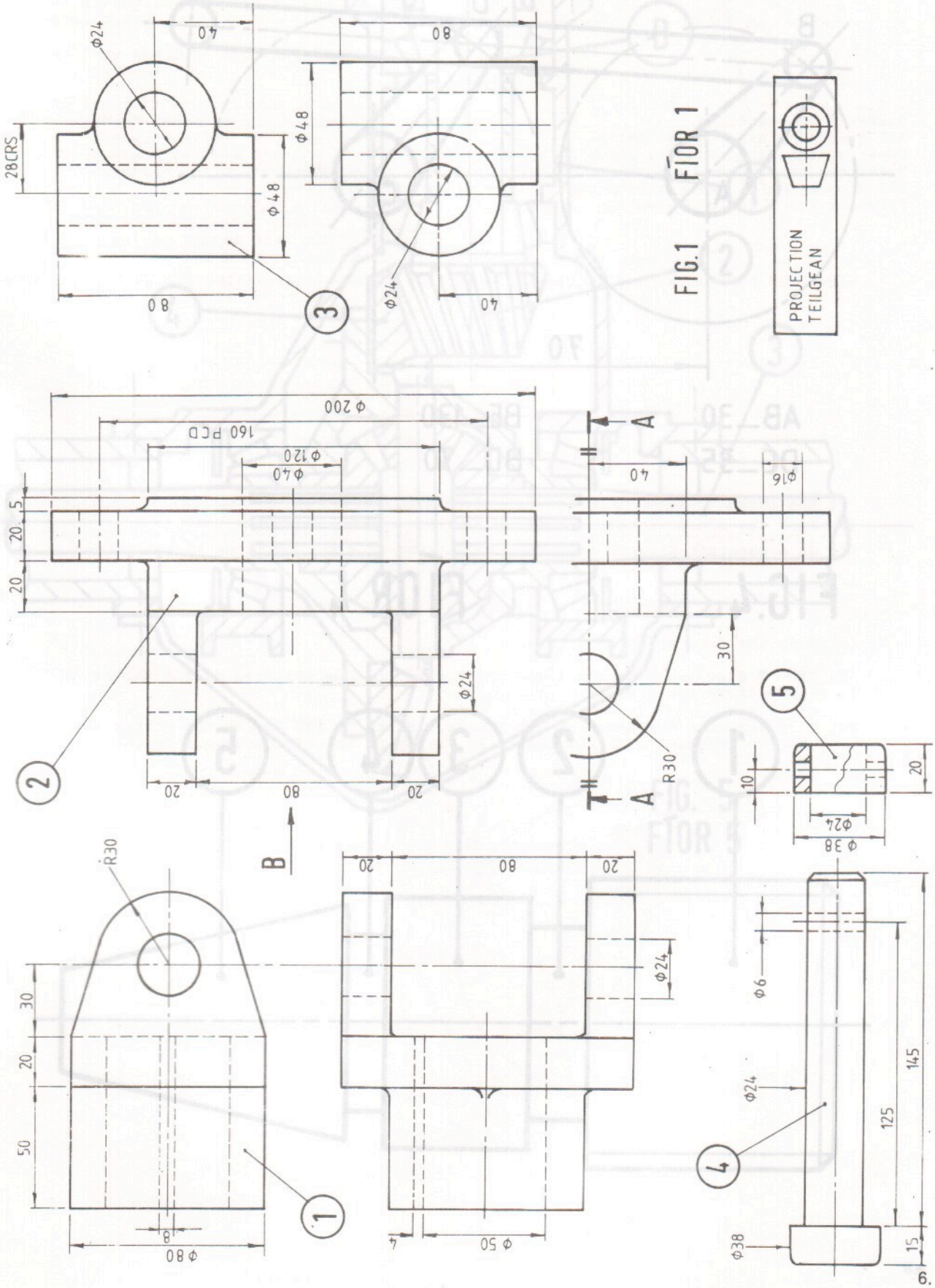
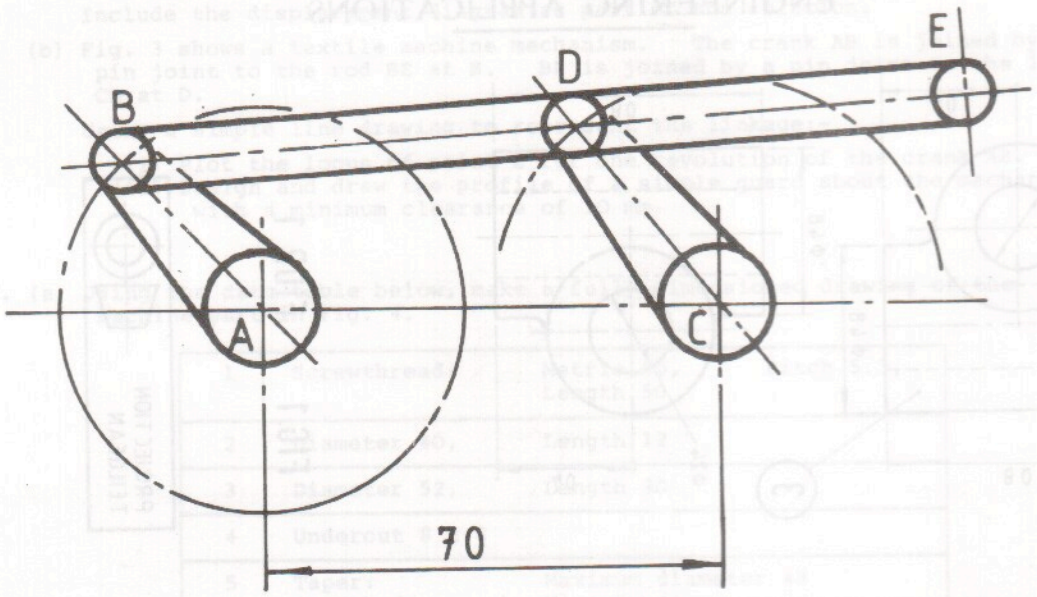
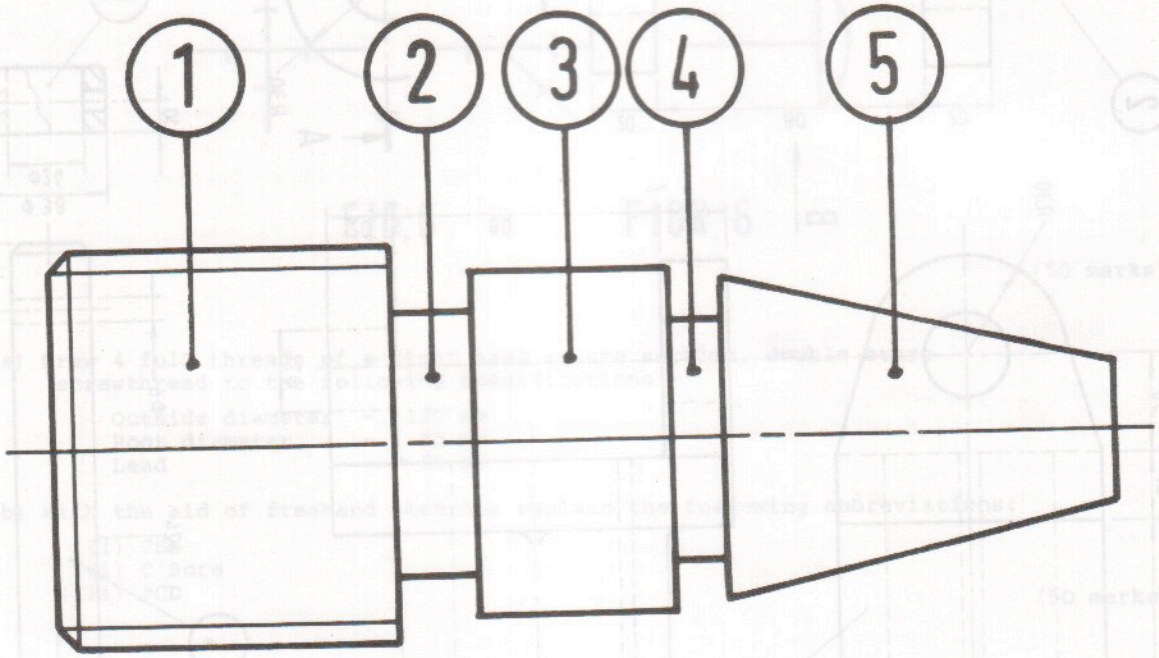


FIG. 3 FÍOR 3



AB_30 BE_130
DC_35 BD_70

FIG. 4 FÍOR 4



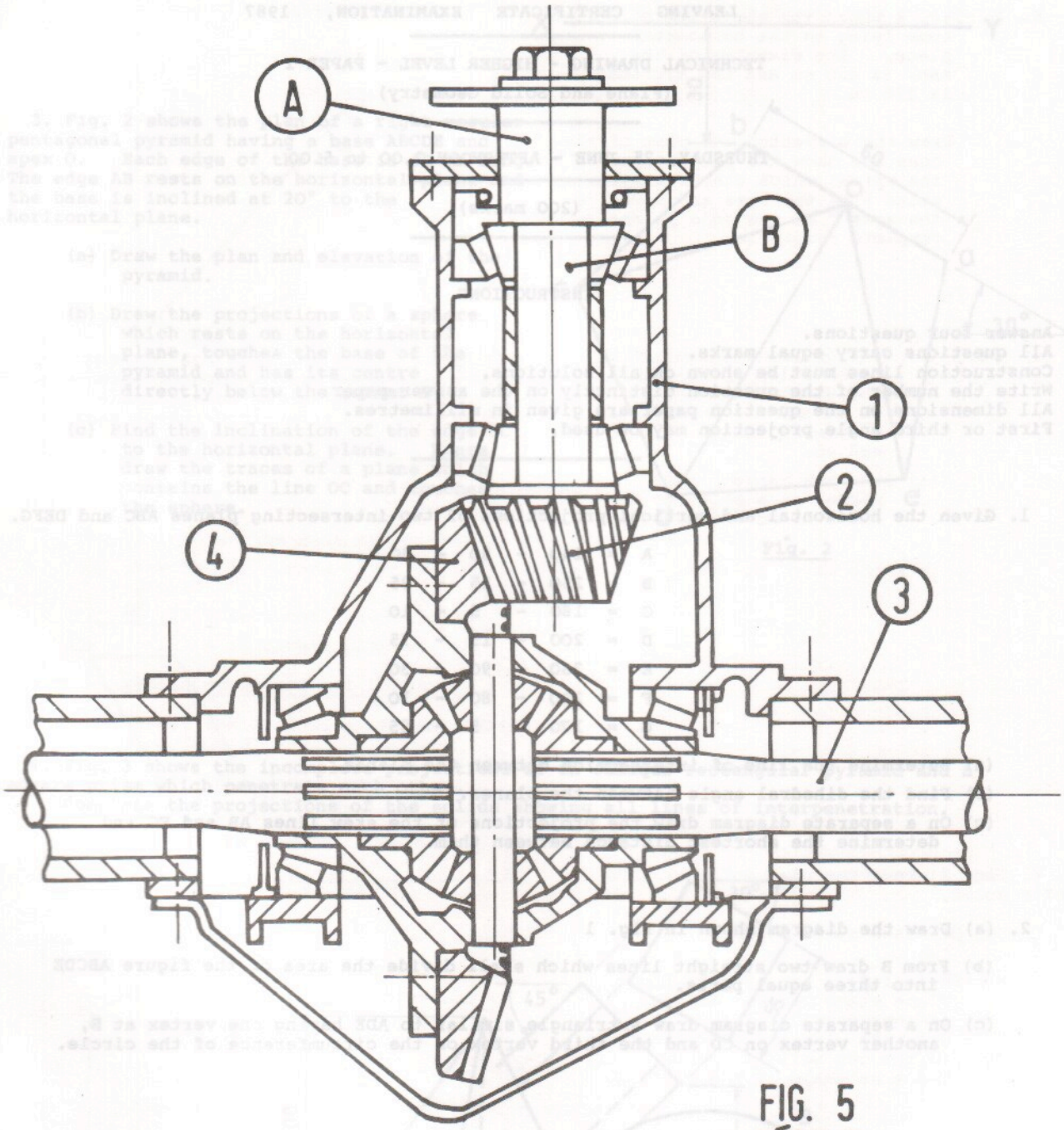


FIG. 5
FIOR 5