LEAVING CERTIFICATE EXAMINATION, 1990

TECHNICAL DRAWING - ORDINARY LEVEL

PAPER II (A) - ENGINEERING APPLICATIONS

200 Marks

THURSDAY, 21 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 SHAFT INSPECTION JIG are given in Fig. 1 with the parts list tabulated below.

INDEX	PART	REQUIRED
1	Base	1
2	Clamp	1
3	Slide	1
4	Screw	1

(a) Make the following drawings of the assembled jig in first or third angle projection, with a 180mm length of shaft, 40mm in diameter, fitted.

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

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

(b) Insert the following on the drawing;

   (i)   Title: SHAFT INSPECTION JIG.

   (ii) ISO projection symbol.

   (iii) Four leading dimensions.

(100 Marks)

2. An incomplete elevation of a pipe fitting is shown in Fig.2.

(a) Draw and complete the given elevation.

(b) Draw the surface development of pipe B, making the seam at HH.

(c) Make a large freehand sketch of a rebated knocked-up joint.

FIG. 2
FÍOR 2
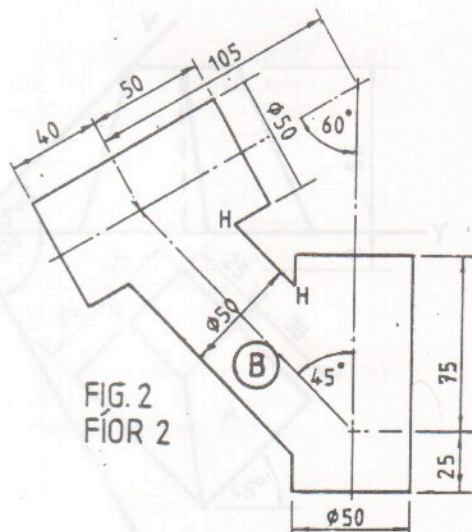
(50 Marks)

3. (a) Draw a radial cam with a minimum radius of 25mm and clockwise rotation to impart the following motion to an in-line knife edge follower:

0° – 60°   Dwell

60° – 150°   Rise 50mm with uniform velocity

150° – 180°   Dwell

180° – 360°   Fall 50mm with uniform acceleration and retardation.

Include the displacement diagram as part of the solution.

(b) Fig. 3 shows a machine link mechanism. Crank OP rotates about O while slider Q slides in horizontal guides. R is an extension link from PQ.

(i) Using a line diagram to represent the linkage, plot the locus of centre R for one revolution of P about O.

(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, showing all specifications, of the machine part in Fig. 4.

1	Point	Included Angle 90°
2	Shaft	Diameter 30, Length 10
3	Screwthread	Metric 40, Pitch 4, Length 100
4	Shaft	Diameter 40, Length 10
5	Control	Diameter 80, Length 50, Chamfers 5 x 5, Hole Diameter 14, Finish: Diamond Knurl.

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

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

(iii) Make a neat freehand sketch showing a method by which part B could be driven by part A.

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

(i)   Fillet

(ii) Flange

(iii) A Key

(50 Marks)

5. (a) Fig. 6 shows the plan and elevation of a bearing bracket. Draw an isometric view of the bracket, viewed in the direction of arrow X, with the quadrant removed on section plane AAA.

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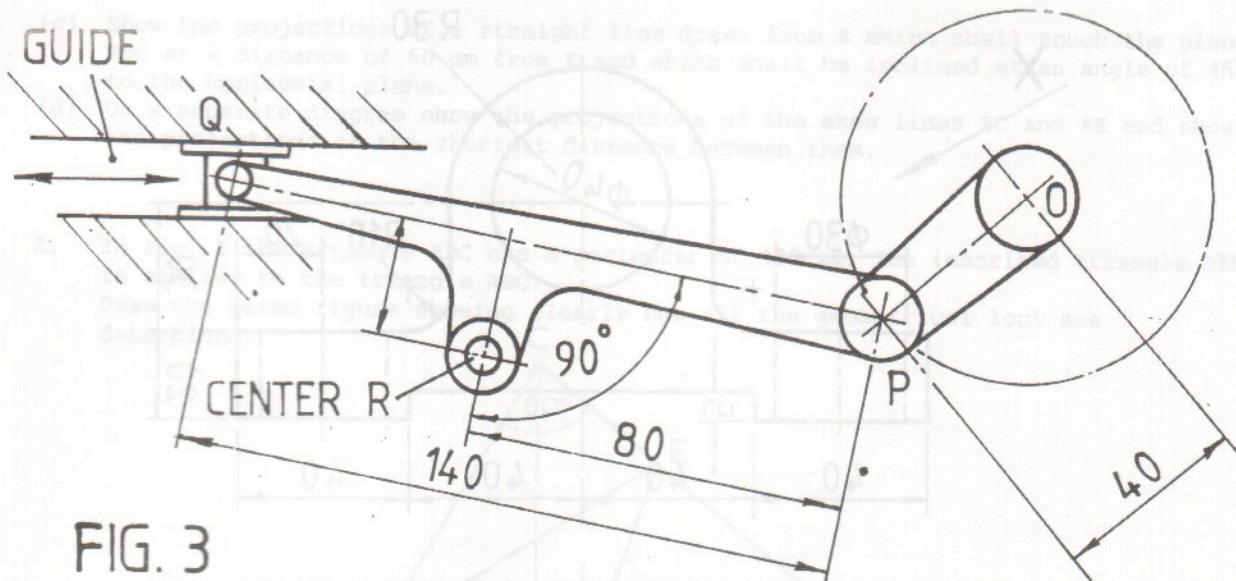
(i)   PCD

(ii) C'BORE

(iii) U'CUT

(50 Marks)

FIG.1 FÍOR 1
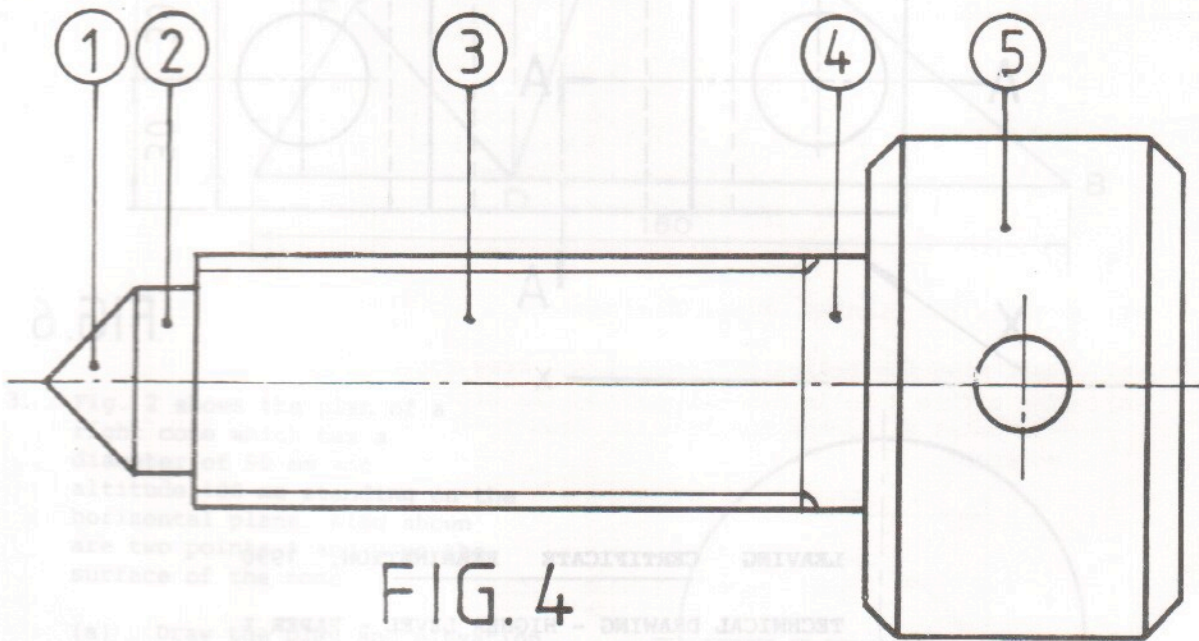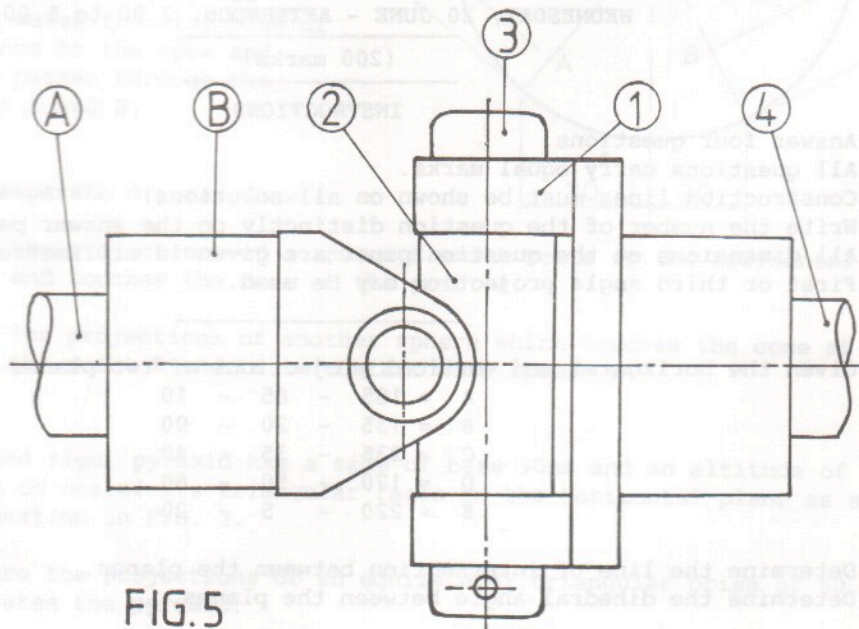
PROJECTION
TEILGEAN

GUIDE

FIG. 3

FIG. 4

FIG. 5

52.

X

R 30

Φ40

Φ30

R10   20

30

20

5

40   40   40   40

A — — — A — A

A

30

30

X

FIG. 6