

**AN ROINN OIDEACHAIS**

M.82

006524

**LEAVING CERTIFICATE EXAMINATION, 1992**

**TECHNICAL DRAWING - ORDINARY LEVEL**

**PAPER II (A) - ENGINEERING APPLICATIONS**

**200 marks**

**MONDAY, 22nd 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 MACHINE VICE are given in Fig. 1 with a parts list tabulated below.

INDEX	PART	REQUIRED
1	BODY	1
2	SCREW	1
3	LOCATING PIN	1
4	MOVABLE JAW	1

- (a) Make the following drawings of the assembly in first or third angle projection.
  - (i) A sectional side elevation on section plane CC.
  - (ii) A half plan projected from view (i).
- (b) Insert the following on the drawings:-
  - (i) Title:- MACHINE VICE ASSEMBLY
  - (ii) ISO projection symbol.
  - (iii) Four leading dimensions.

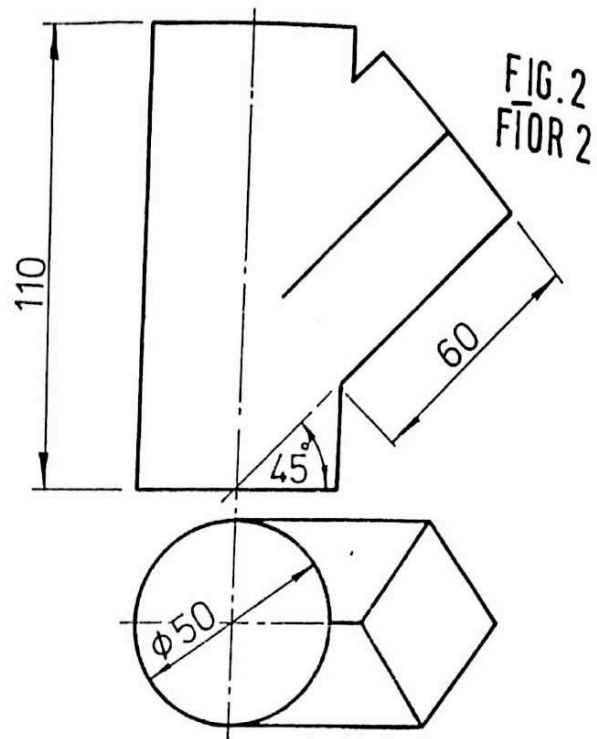
**(100 marks)**

**OVER→**

2. The Plan and incomplete elevation of the junction between a cylindrical and a square pipe are shown in Fig. 2.

- (a) Draw the plan and complete the elevation.
- (b)
  - (i) Draw the surface development of the square pipe with the joint on the shortest edge.
  - (ii) Draw the true shape of the hole in the cylinder.
- (c) Make a large freehand sketch of a *single bead swage* as used in sheet metalwork.

(50 marks)



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

Rise 50 mm with uniform velocity for 0.25 seconds.

Dwell for 0.25 seconds.

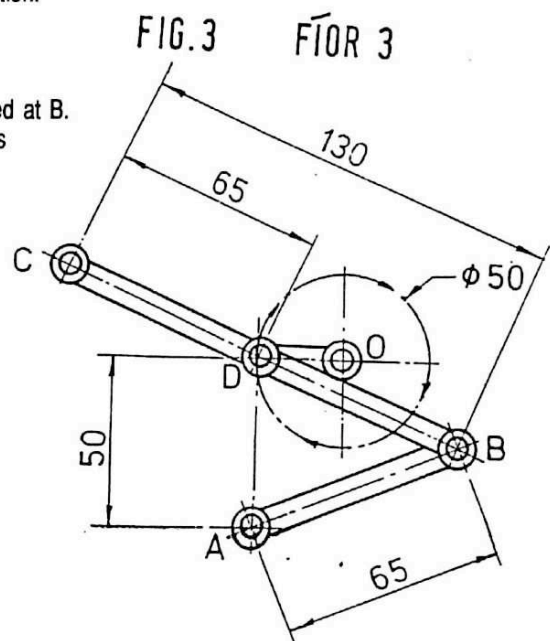
Fall to initial position with simple harmonic motion for 0.5 seconds.

Include the displacement diagram as part of the solution.

(b) Fig. 3 shows a machine linkage. A and O are fixed points and AB and BC are two links which are pivoted at B. The point D is connected to a crank pin which moves in the pitch circle as indicated.

- (i) Using a line diagram to represent the linkage plot the locus of C for one revolution of D about O.
- (ii) Draw the profile of a simple machine guard about the mechanism with a minimum clearance of 15 mm.

(50 marks)



4. (a) Using the data table below, make a fully dimensioned drawing, showing all specifications, of the adjusting screw shown in Fig. 4. Use the shoulder indexed  $\sqrt{\quad}$  as the datum.

1	Diameter 16, length 10, sphere radius 16.
2	Screwthread - Metric 20, Pitch 2.5, Length 40.
3	Length 10, Diameter 16.
4	Diameter 40, Length 10, radius 5.
5	Diameter 80, Length 30, Chamfer 3 x 45°. Finish - Diamond Knurl.

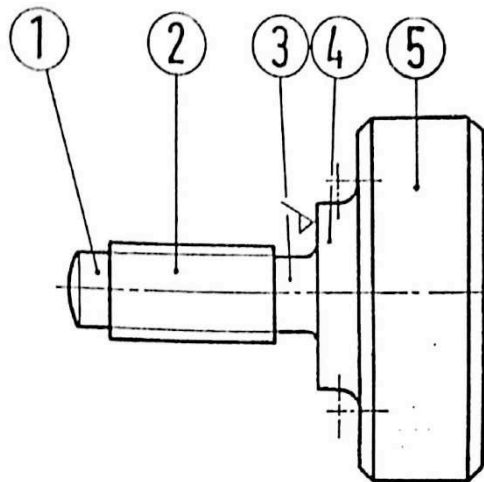


FIG. 4 FIGOR 4

- (b) (I) Identify the mechanism shown in Fig. 5.  
 (II) Name the Parts 1, 2, 3, 4.  
 (III) Sketch and name a clip, suitable for retaining part A in the housing B.
- (c) With the aid of freehand sketches explain any two of the following engineering terms:  
 (I) BUSH  
 (II) TAPER  
 (III) LUG

(50 marks)

OVER→

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

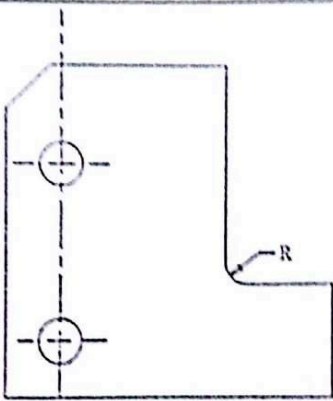
**SECTION A**

- (a) Fig. 6 shows a plan and elevation of a guide shoe. Draw an isometric view of the shoe, viewed in the direction of arrow x, with the quadrant removed on section plane AAA.
- (b) By means of large freehand sketches, distinguish between the following:
- (i) ROUND KEY.
  - (ii) WOODRUFF KEY.
  - (iii) SQUARE KEY.

or

**SECTION B**

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

 <p style="text-align: center;">Fig. 6.1 Fig. 6.2</p>	<p style="text-align: center;">Drawing commands used in Fig. 6.1</p> <ol style="list-style-type: none"> <li>1. line _____</li> <li>2. _____</li> <li>3. _____</li> <li>4. _____</li> <li>5. _____</li> <li>6. _____</li> <li>7. _____</li> </ol>
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- (b) Name three types of INPUT device used in computer aided drawing.
- (c) Which of the following produces the best quality hard copy:
- (i) DOT MATRIX PRINTER.
  - (ii) INK JET PRINTER.
  - (iii) PLOTTER.
- (d) With the aid of a sketch and a short note, explain what is meant by incremental programming

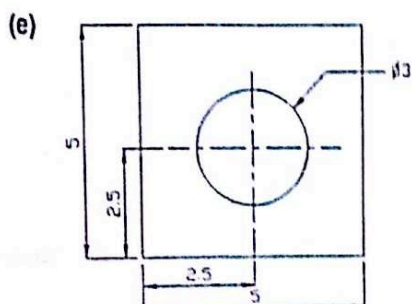


Fig. 6.2  
Fig. 6.2

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

- (i) 0.05
- (ii) 0.25.
- (iii) 0.5.
- (iv) 1.

(50 marks)

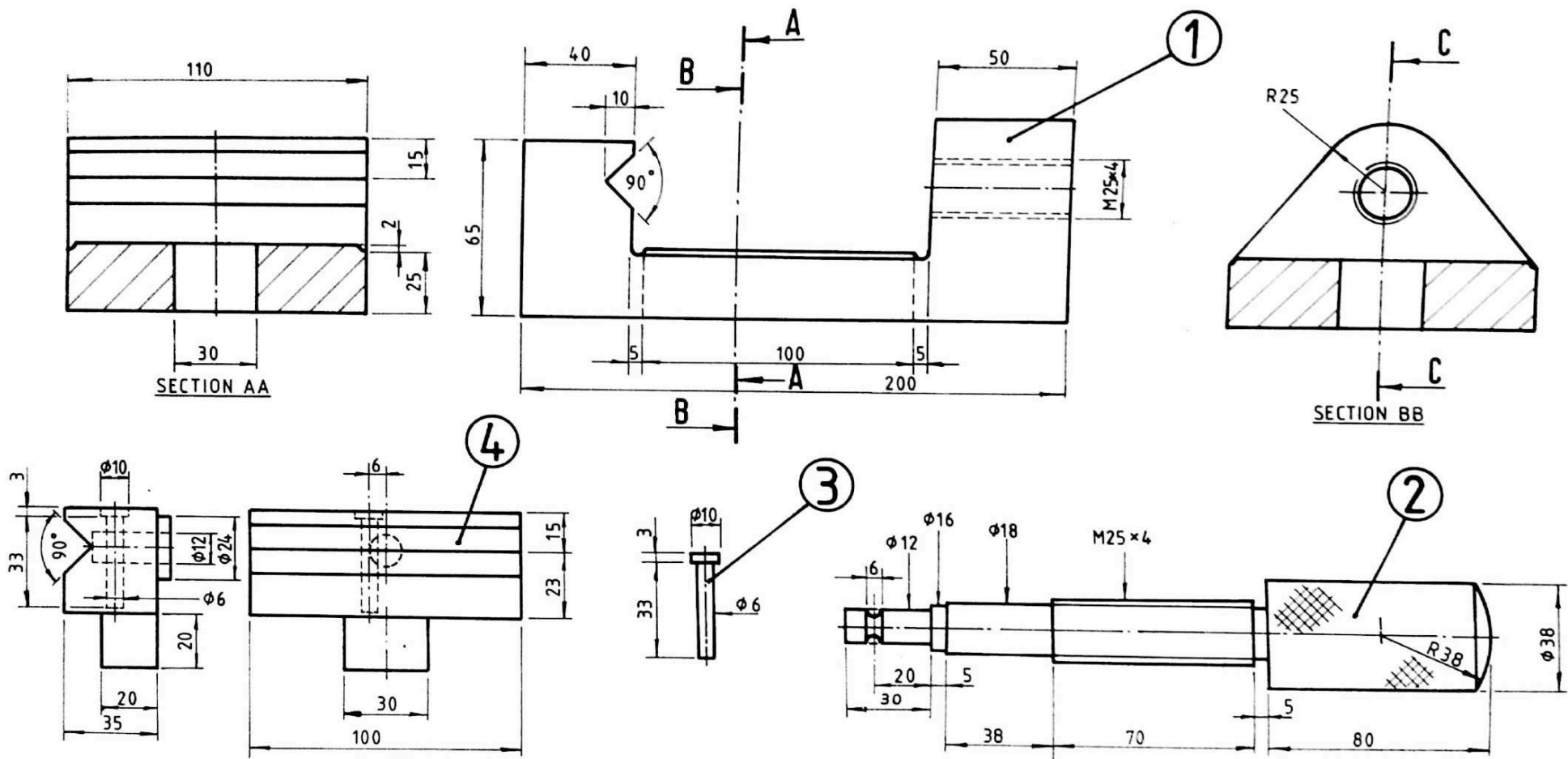


FIG. 1 FIOR 1

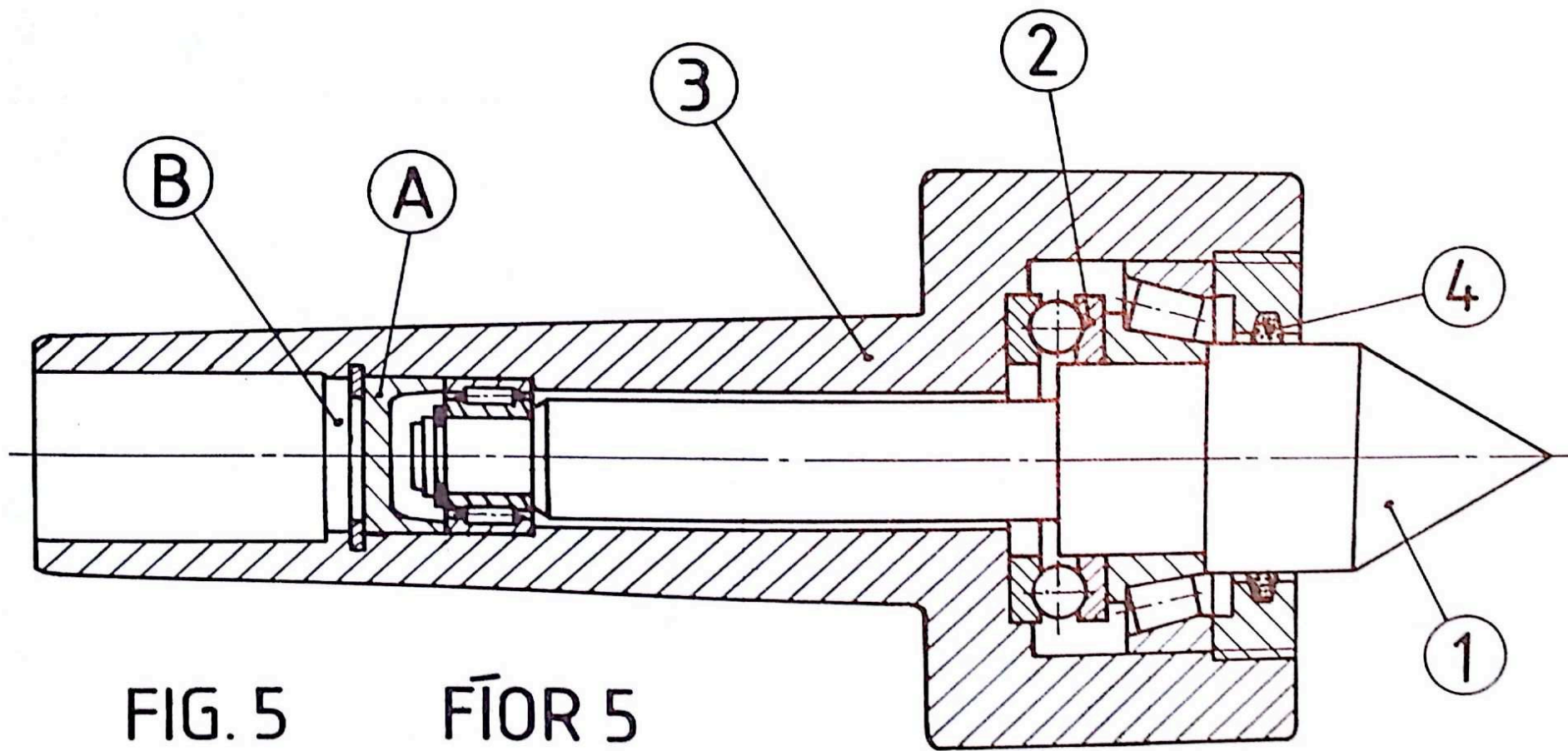


FIG. 6 F10R 6

