



***Leaving Certificate Examination 2007***

***Technical Drawing***  
***Paper II(A) – Ordinary Level***  
***(Engineering Applications)***

***(200 Marks)***

***Friday 15 June***  
***Afternoon, 2.00 - 5.00***

***Instructions***

- (a)*** Ensure that you have received examination paper M82(L) which accompanies this paper.
- (b)*** Answer question 1 and **two** other questions.
- (c)*** Drawings and sketches should be in pencil unless otherwise stated.
- (d)*** Where dimensions are omitted they may be estimated.
- (e)*** Credit will be given for neat orderly presentation of work.
- (f)*** Work on one side of the paper only.
- (g)*** Your Examination Number should be written on each drawing sheet used.

**Note:** The following drawings are shown on examination paper M.82(L) which accompanies this paper: Fig. 1, Fig. 5(a), Fig. 5(b), and Fig. 5(c).

1. Details of a Roller Support Bracket are shown in Fig.1 with a parts list tabulated below.

PART	NAME	REQUIRED
1	Base Plate	1
2	Bracket	2
3	Roller	1
4	Bush	2
5	Shaft	1
6	Set Screw	2

(a) Assemble the parts and draw, full size, the following views:

- (i) a sectional elevation on plane A-A;
- (ii) a plan projected from (i).

(b) Insert the following on your drawing:

- (i) Title:- ROLLER SUPPORT BRACKET;
- (ii) ISO projection symbol;
- (iii) Four principal dimensions.

(100 marks)

2. Fig.2 shows the elevation and end elevation of a cylindrical pipe which is connected to a triangular duct. A pictorial view is also shown.

*The pictorial view shows material thickness which may be ignored for the purposes of your drawing.*

(a) Draw the given elevation and end elevation.

(b) Draw a surface development of the cylindrical pipe with C-C as the seam line.

(50 marks)

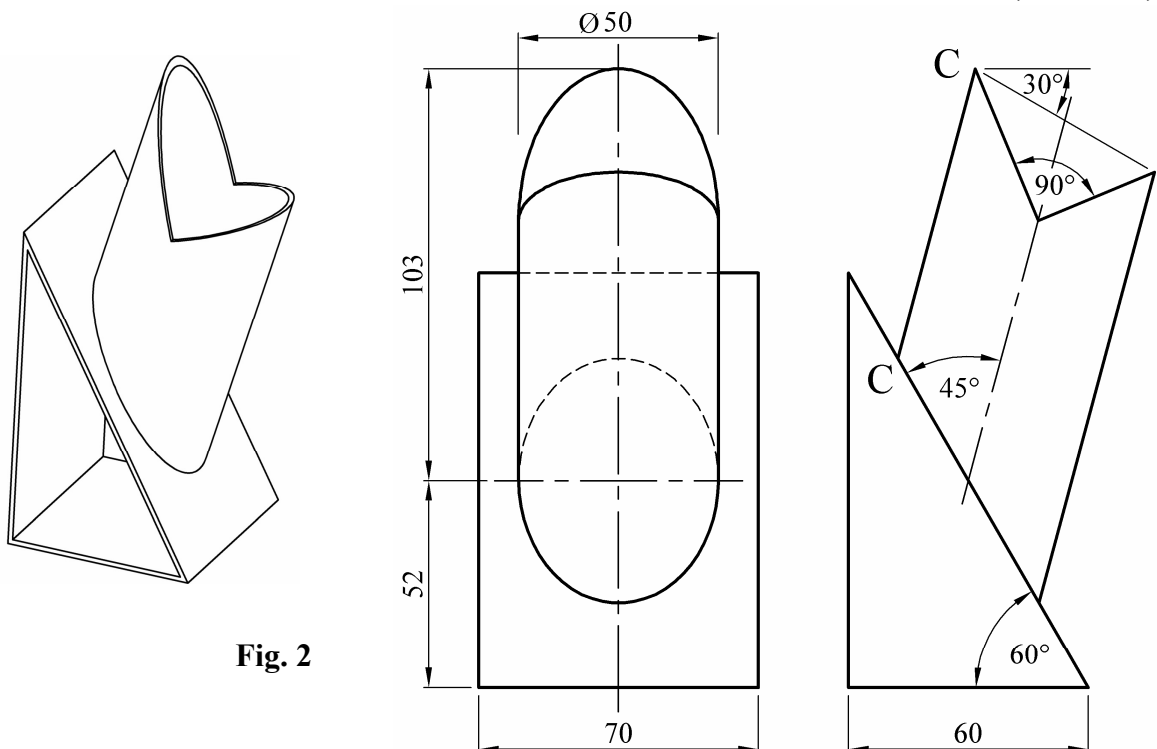


Fig. 2

3. (a) A radial plate cam has a minimum radius of 42mm and a camshaft diameter of 20mm. The cam rotates in a clockwise direction and imparts the following motion to an inline knife-edge follower:

0° to 30° Dwell;

30° to 210° Rise 54mm with uniform acceleration and retardation;

210° to 270° Fall 14mm with uniform velocity;

270° to 360° Fall 40mm with simple harmonic motion.

Draw the profile of the cam.

Include the displacement diagram as part of the solution.

- (b) Fig. 3 shows a link mechanism. Crank OA rotates in an anti-clockwise direction about the fixed point O. A and B are pin joints. Crank BC pivots about the fixed point C.
- Using a line diagram to represent the mechanism, plot the locus of point P for one revolution of the crank OA.
  - Draw the profile of a simple machine guard about the mechanism with a minimum clearance of 15mm.

(50 marks)

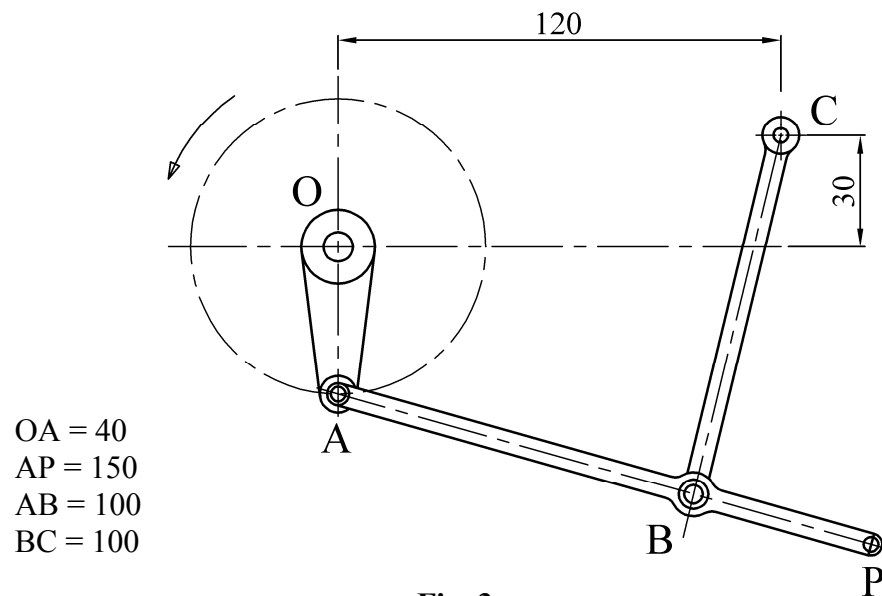
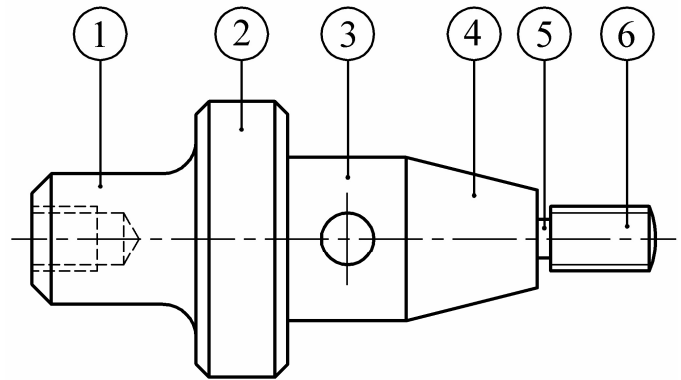


Fig. 3

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

Fig. 4(a)



1	Diameter 40, Length 50, Chamfer 6 x 6, Fillet radius 10, Screwthread Metric 20, Pitch 2.5, Depth of thread 20
2	Diameter 84, Length 28, Chamfer 4 x 4, Finish diamond knurl
3	Diameter 50, Length 36, Diameter 16 hole through centre
4	Minimum diameter 30, Length 40
5	Undercut 4 x 4
6	Length 30, Screwthread Metric 20, Pitch 2.5

- (b) Fig. 4(b) shows a part section through a portion of a typical engine.

- Draw a parts list, in table format, which includes the item number and name for each of the parts 1, 2, 3, 4 and 5.
- Explain, with the aid of freehand sketches, the operation of the engine mechanism.

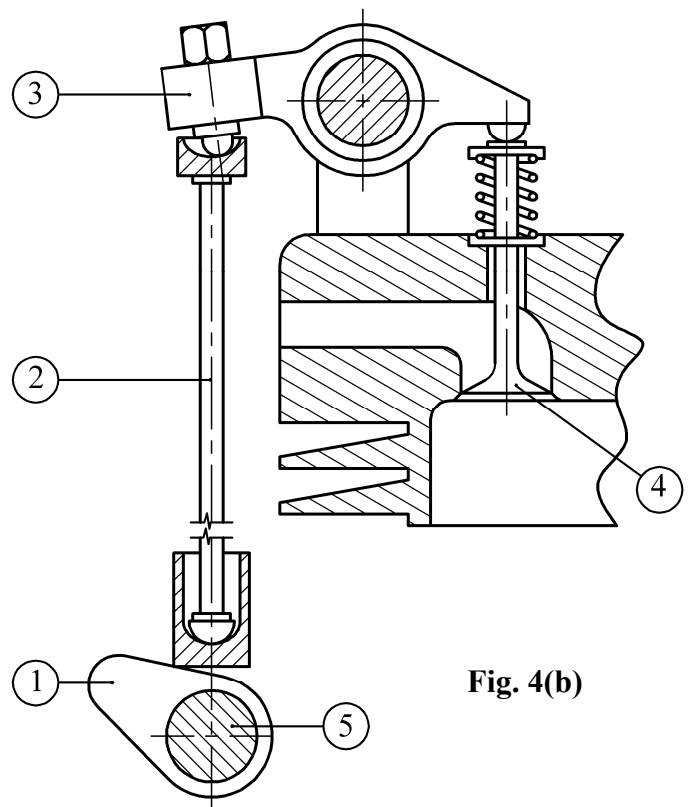


Fig. 4(b)

- (c) Using large freehand sketches, explain the following engineering terms associated with an engine:

- Piston;
- Connecting rod;
- Gudgeon pin.

(50 marks)

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

**SECTION A**

- (a) Fig.5(a) shows the elevation and end elevation of a machine casting. Draw an isometric view of the casting with the portion in front of the section plane A-A removed. Point P is to be the lowest point on the drawing.
- (b) Using large freehand sketches illustrate the following:
- (i) Splined shaft;
  - (ii) Keyway;
  - (iii) Stud.

**(50 marks)**

**OR**

**SECTION B**

- (a) List **six** CAD commands necessary to produce the drawing in Fig.5(b).
- (b) By means of sketches and a short note, explain the purpose of the following commands:
- (i) Mirror;
  - (ii) Break;
  - (iii) Extend.
- (c) Using a large freehand sketch, draw the object shown in Fig. 5(c) as a wireframe representation.
- (d) Draw, full size, the object that would be displayed on a CAD system when the following commands are executed:
- (All points (X,Y) are specified using absolute co-ordinates. The origin (0,0) is located at the lower left corner of the display)*
- A rectangle is drawn with its lower left corner at (30,30) and its upper right corner at (190,65)
  - The upper corners of the rectangle are chamfered 15 x 15
  - A line joins the lower ends of the chamfer lines
  - A line AB is drawn using the following co-ordinates:  
A (75,65) B (75,115)
  - The line AB is offset 70mm to the right. This new line is indexed CD (point C is on top)
  - A circular arc is drawn to pass through points B, C and point E (110,215)
  - A 30mm diameter circle is drawn concentric with the arc
  - A 16mm diameter circle is drawn with its centre at point (110,195)
  - The circle is the subject of a circular (polar) array consisting of a total of 5 items. The centre of the array is located at the centre of the three point arc
  - A rectangle is drawn with its lower left corner at (85,78) and its upper right corner at (135,102)

**(50 marks)**



***Scrúdú Ardteistiméireachta 2007***  
***Leaving Certificate Examination 2007***

# ***Líníocht Theicniúil***

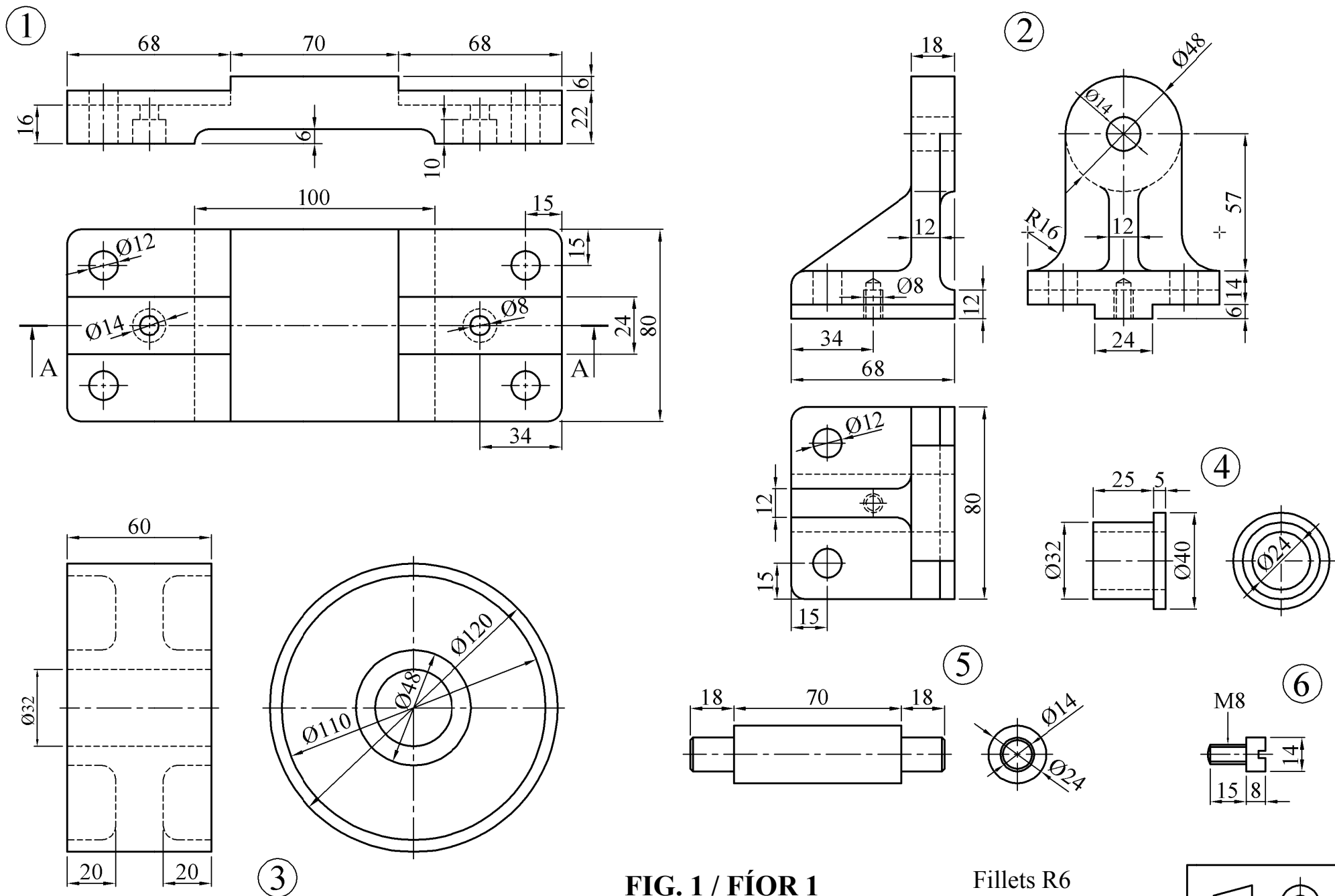
## ***Technical Drawing***

***Páipéar II(A) – Gnáthleibhéal***  
***Paper II(A) – Ordinary Level***

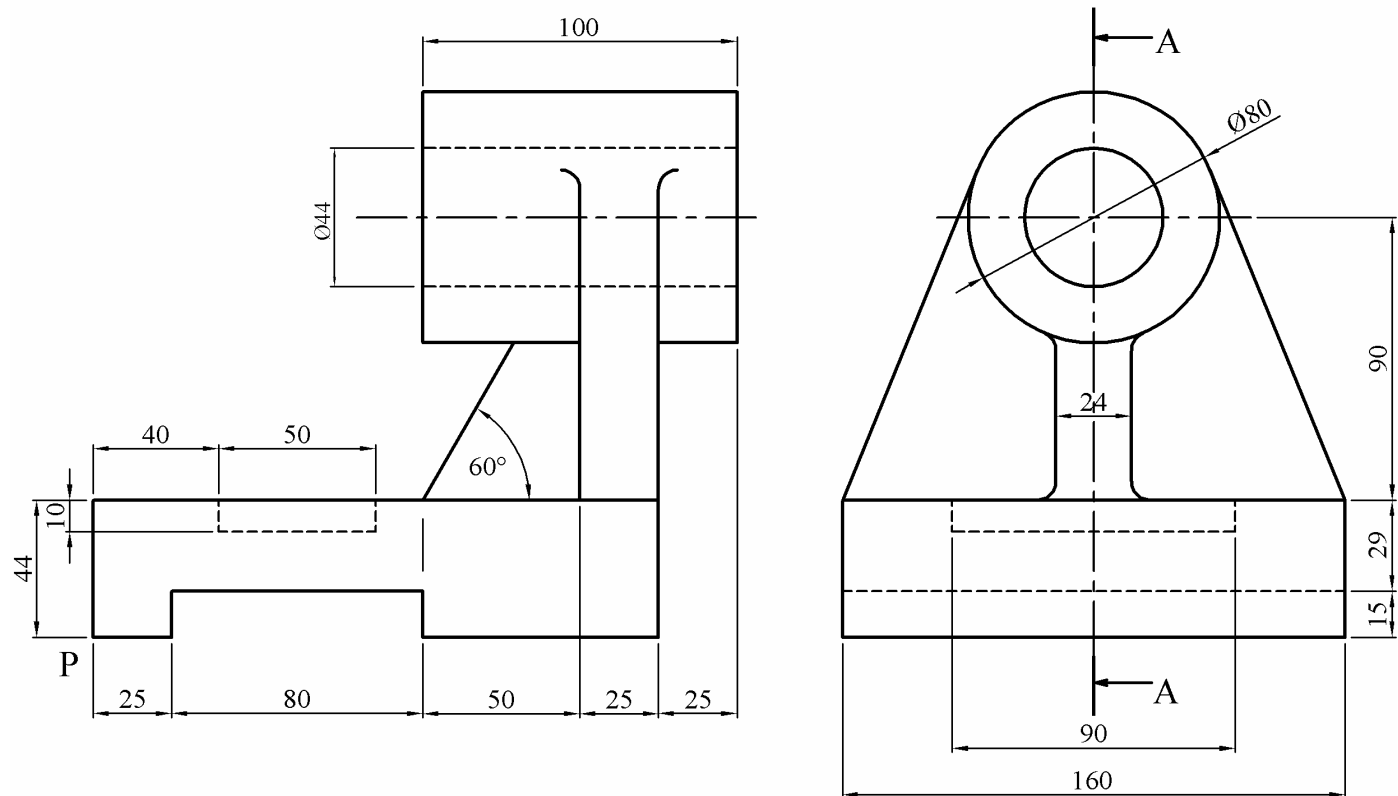
***(Feidhmiúcháin Innealtóireachta)***  
***(Engineering Applications)***

***Dé hAoine 15 Meitheamh, Tráthnóna, 2.00 - 5.00***  
***Friday 15 June, Afternoon, 2.00 - 5.00***

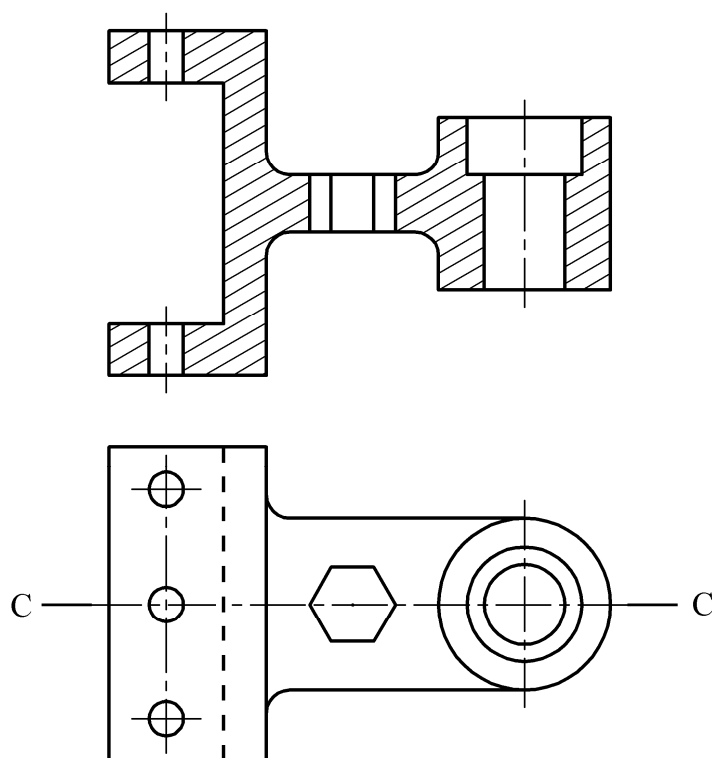
**NÓTA:** Deimhnigh go bhfuair tú scrúdpháipéar M82T, a ghabhann leis an bpáipéar seo.  
**NOTE:** Ensure that you have received examination paper M82 which accompanies this paper.



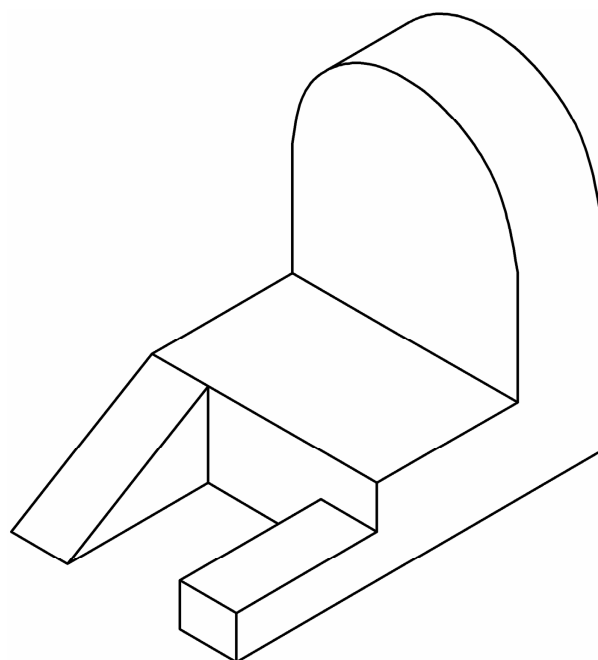
**FIG. 1 / FÍOR 1**



**Fig. 5(a) Fíor 5(a)**



**Fig. 5(b) Fíor 5(b)**



**Fig. 5(c) Fíor 5(c)**