



Leaving Certificate Examination 2006

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

(200 Marks)

Friday 16 June
Afternoon, 2.00 - 5.00

Instructions

- (a)*** Ensure that you have received examination paper M.82(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 Flat Belt Pulley Bracket are shown in Fig.1 with a parts list tabulated below.

PART	NAME	REQUIRED
1	Body	1
2	Spindle	1
3	Pulley	1
4	Bush	2
5	Collar	1
6	Grub Screw	1
7	Washer	1
8	Hexagonal Nut	1

(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:- PULLEY BRACKET;
- (ii) ISO projection symbol;
- (iii) Four principal dimensions.

(100 marks)

2. Fig.2 shows the elevation and plan of a pipe and base plate from an air duct cover. 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 plan and elevation.
- (b) Draw a surface development of the pipe with C-C as the seam line.
- (c) Make a neat freehand sketch of a suitable joint for the seam C-C.

(50 marks)

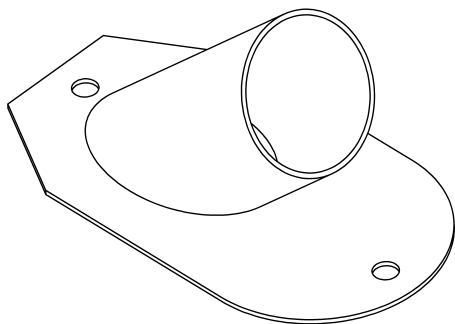
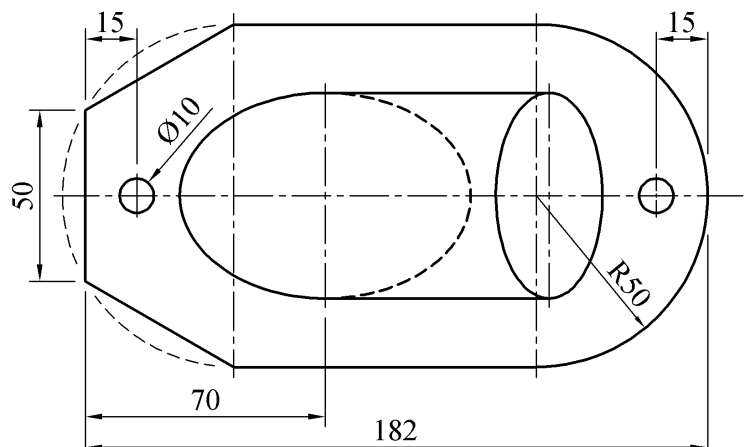
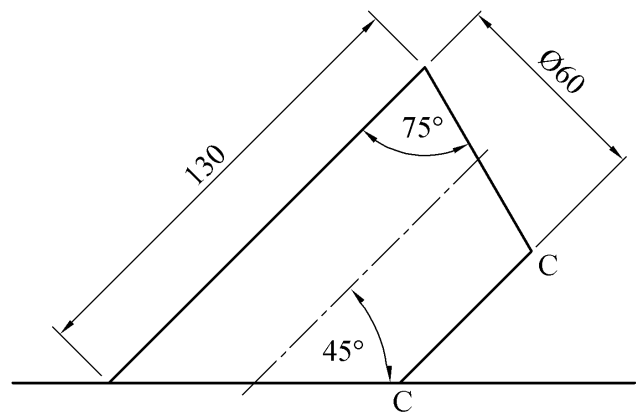


Fig. 2

3. (a) A radial plate cam has a minimum radius of 40mm and a camshaft diameter of 22mm. The cam rotates in a clockwise direction and imparts the following motion to an inline knife-edge follower:

0° to 180° Rise 60mm with uniform acceleration and retardation;

180° to 210° Dwell;

210° to 300° Fall 40mm with simple harmonic motion;

300° to 360° Fall 20mm with uniform velocity.

Draw the profile of the cam.

Include the displacement diagram as part of the solution.

- (b) Fig. 3 shows a link mechanism. A and C are fixed points. Crank AB rotates in an anti-clockwise direction. Link BDEF is pin jointed at B and D. Link CD oscillates about point C.

- (i) Using a line diagram to represent the mechanism, plot the locus of point F for one revolution of the crank AB.
- (ii) Draw the profile of a simple machine guard about the mechanism with a minimum clearance of 15mm.

(50 marks)

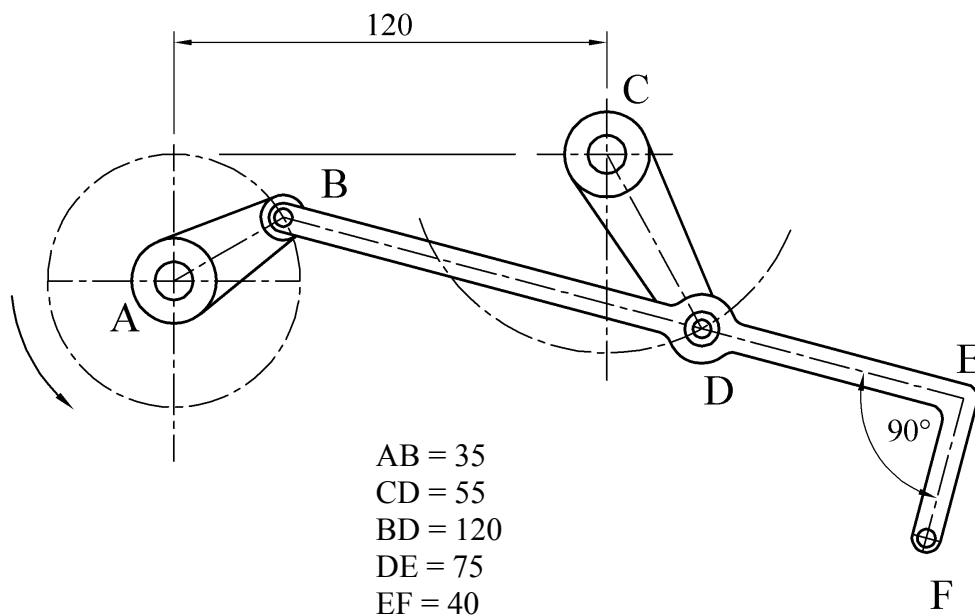


Fig. 3

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

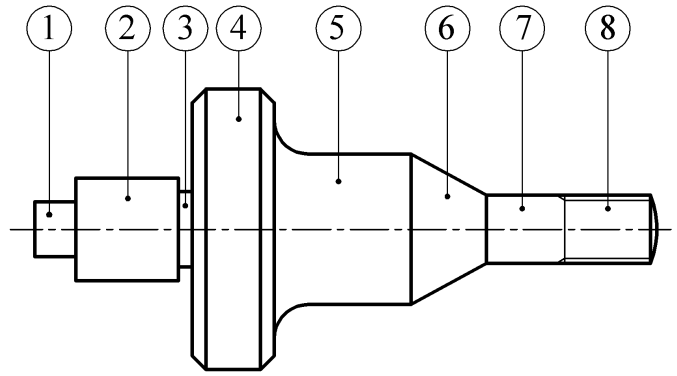


Fig. 4(a)

1	Square 16, Length 12
2	Diameter 30, Length 30
3	Undercut 4 x 4
4	Diameter 82, Length 24, Chamfer 4 x 4
5	Diameter 44, Fillet radius 10, Length 40
6	Maximum diameter 44, Minimum diameter 20, Length 22
7	Diameter 20, Length 23
8	Screwthread Metric 20, Pitch 2.5, Length 25

- (b) Fig. 4(b) shows a lever type relief valve.

- 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 and with reference to the letters A, B, C, D and E, the operation of the air relief valve.
- Explain, with the aid of sketches, how the valve could be regulated to operate at different air pressures.

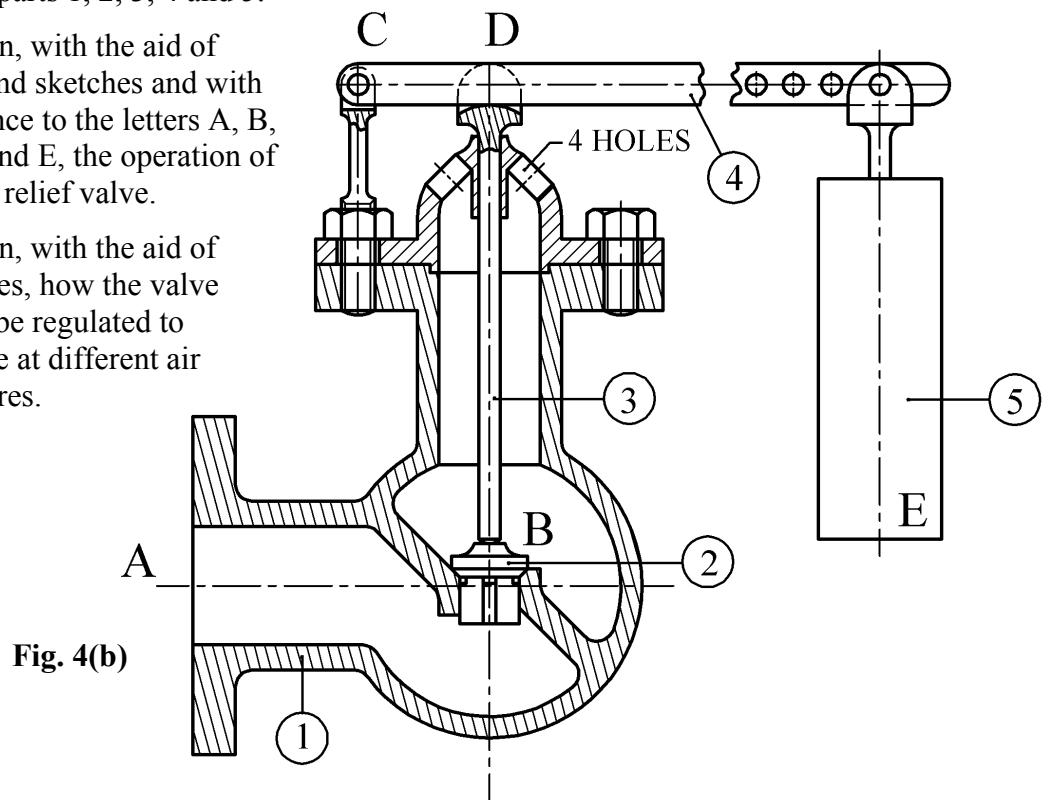


Fig. 4(b)

- (c) Using large freehand sketches, explain the following engineering terms:
- Flanged elbow;
 - Rolled steel channel;
 - Butterfly valve.

(50 marks)

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

SECTION A

- (a) Fig.5(a) shows the elevation and plan 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.

(50 marks)

OR

SECTION B

- (a) List, in the order in which they would be used, **six** Computer Aided Drawing 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) Lengthen;
 - (ii) Pan;
 - (iii) Zoom.
- (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)

- Five lines AB, AE, EF, FG and GH are drawn using the following co-ordinates:
A (50,50) B (90,50) E (50,184) F (60,184) G (60,100) H (140,100)
- From B, a line is drawn to C, which is defined by the relative polar coordinates @40<60
- From C, a line is drawn to D, which is defined by the relative polar coordinates @30<0
- The lines FG and GH are filleted at G with a radius of 15mm
- A polyline KL, with a width of 5mm, is drawn using the following co-ordinates:
K (60,174) L (70,174)
- The shape drawn, is then mirrored about the line DH
- A circle, of 140mm diameter, is drawn with its centre point at (140, 174)
- A rectangle is drawn with its lower left corner at (101,130) and its upper right corner at (113,138)
- This rectangle is duplicated 16 times in a rectangular array consisting of four rows and four columns. There is an 18mm array distance between the rows and a 22mm array distance the between the columns
- A rectangle is drawn with its lower left corner at (101,204) and its upper right corner at (179,219)

(50 marks)



Scrúdú Ardteistiméireachta 2006
Leaving Certificate Examination 2006

Líníocht Theicniúil

Technical Drawing

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

(Feidhmiúcháin Innealtóireachta)
(Engineering Applications)

Dé hAoine 16 Meitheamh, Tráthnóna, 2.00 - 5.00
Friday 16 June, Afternoon, 2.00 - 5.00

NÓTA: Deimhnigh go bhfuair tú scrúdpháipéar M.82T, a ghabhann leis an bpáipéar seo.

NOTE: Ensure that you have received examination paper M.82 which accompanies this paper.

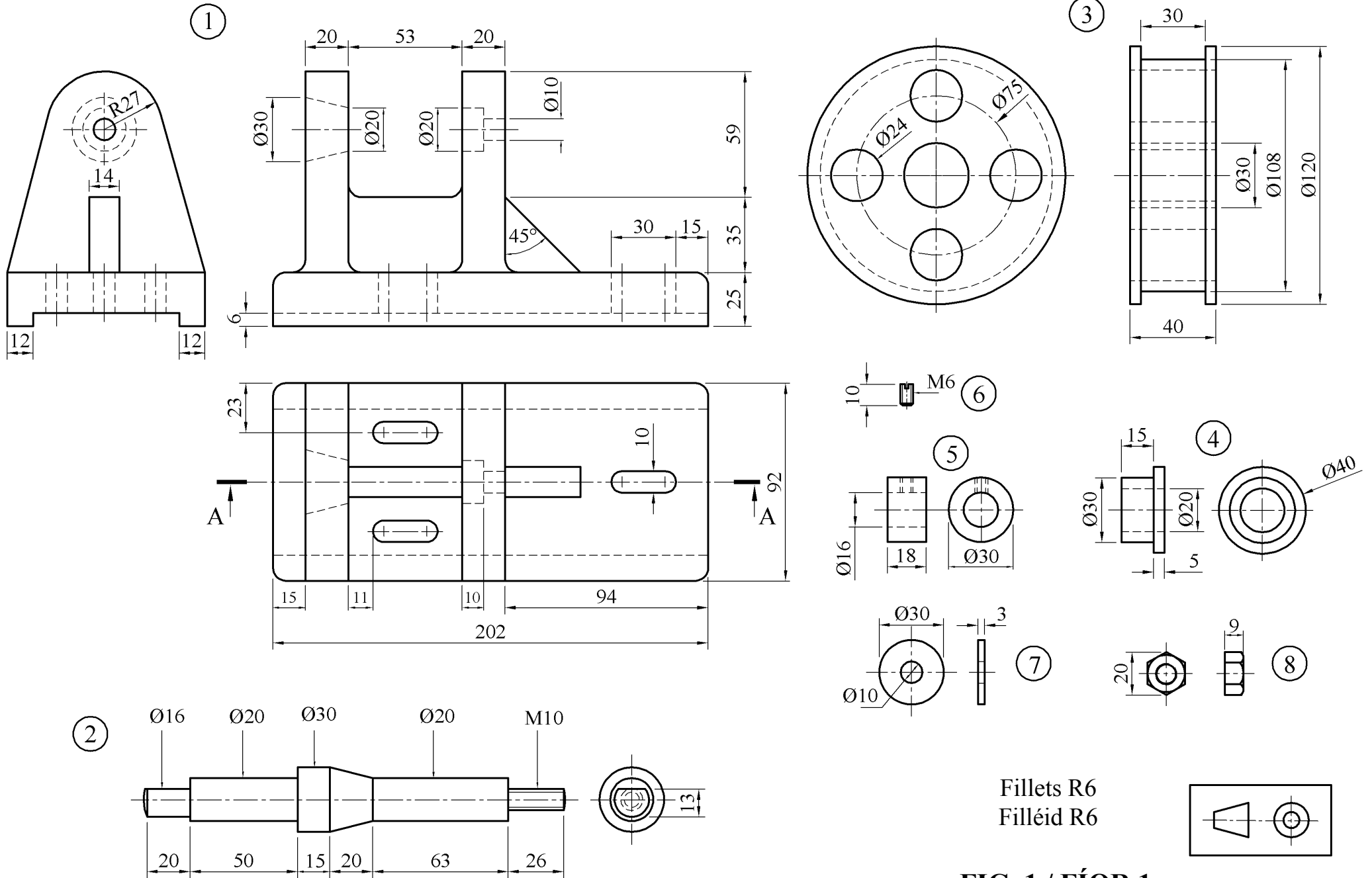


FIG. 1 / FÍOR 1

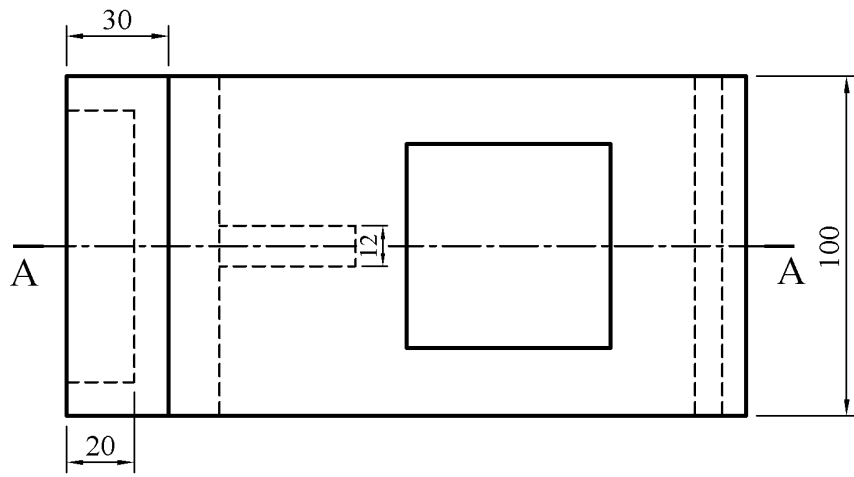
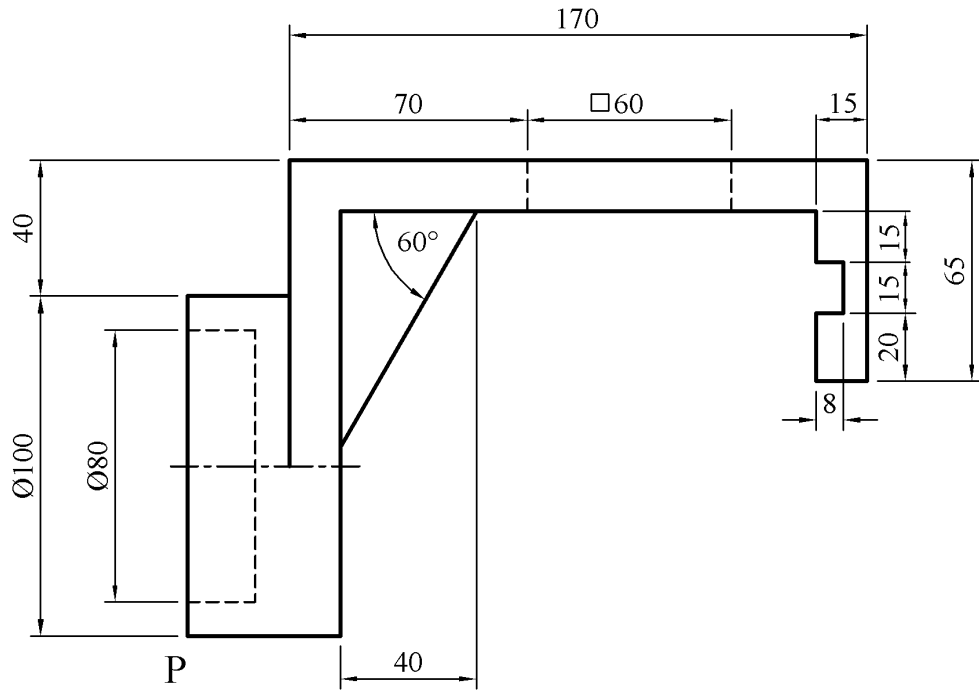


Fig. 5(a) Fíor 5(a)

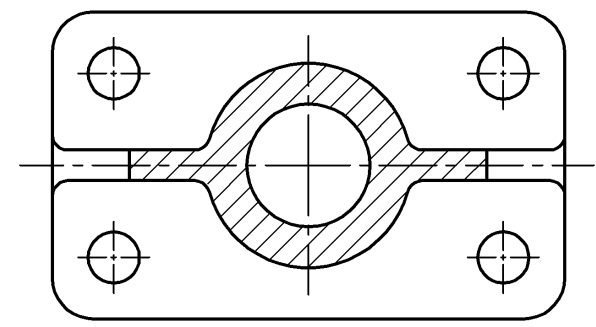
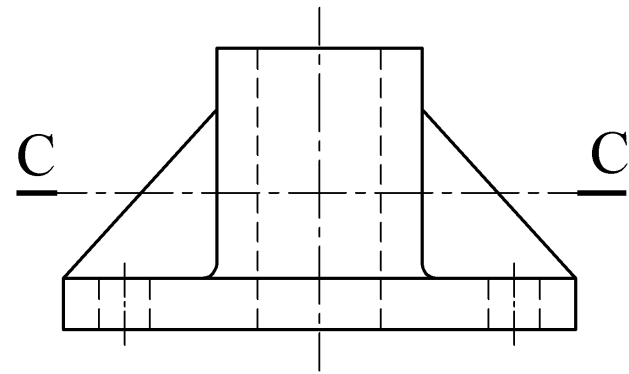


Fig. 5(b) Fíor 5(b)

Fig. 5(c) Fíor 5(c)

