

1. Details of a "Pulley Bracket" are given in Fig. 1 with a parts list tabulated below.

Ordinary Level - 2001 - Paper

PART	NAME	REQUIRED
1	Bracket	1
2	Pin	1
3	Pulley	1
4	Hexagonal Nut	1
5	Flat Washer	1

- (a) Make the following drawings of the assembly in first or third angle projection.
- Elevation B.
 - A sectional elevation on the cutting plane AA looking in the direction of the arrows.
- (b) Insert the following on the drawings:
- Title: Pulley Bracket.
 - ISO Projection Symbol.
 - Four leading dimensions.

(100 marks)

2. Fig. 2 shows three pipes of 60 mm diameter with their axis in the same plane and forming a bend through 90°.

- Draw the given view.
- Draw the surface development of Pipe B using XX as the seam line.
- The joint used on the seam is an external grooved seam. Make a large freehand sketch of the joint.

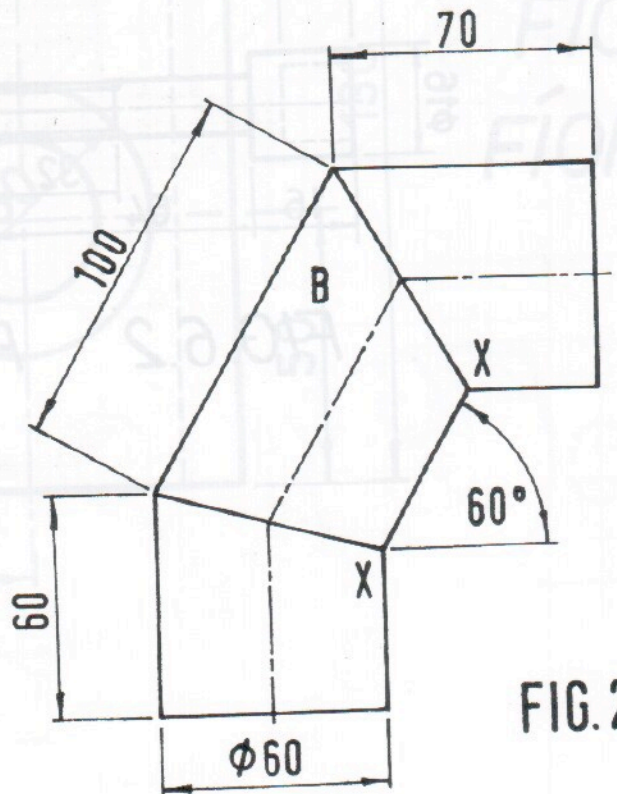


FIG. 2

(50 marks)

3. (a) A radial plate cam rotates in a clockwise direction and operates an in-line knife edge follower. The nearest approach of the follower to the cam centre is 40 mm. The camshaft diameter is 20 mm. Draw the cam profile to impart the following motion to the follower:-

0° to 180° Rise 50 mm with simple harmonic motion.

180° to 270° Dwell.

270° to 360° Fall 50 mm with uniform velocity.

Include the displacement diagram as part of the solution.

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

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

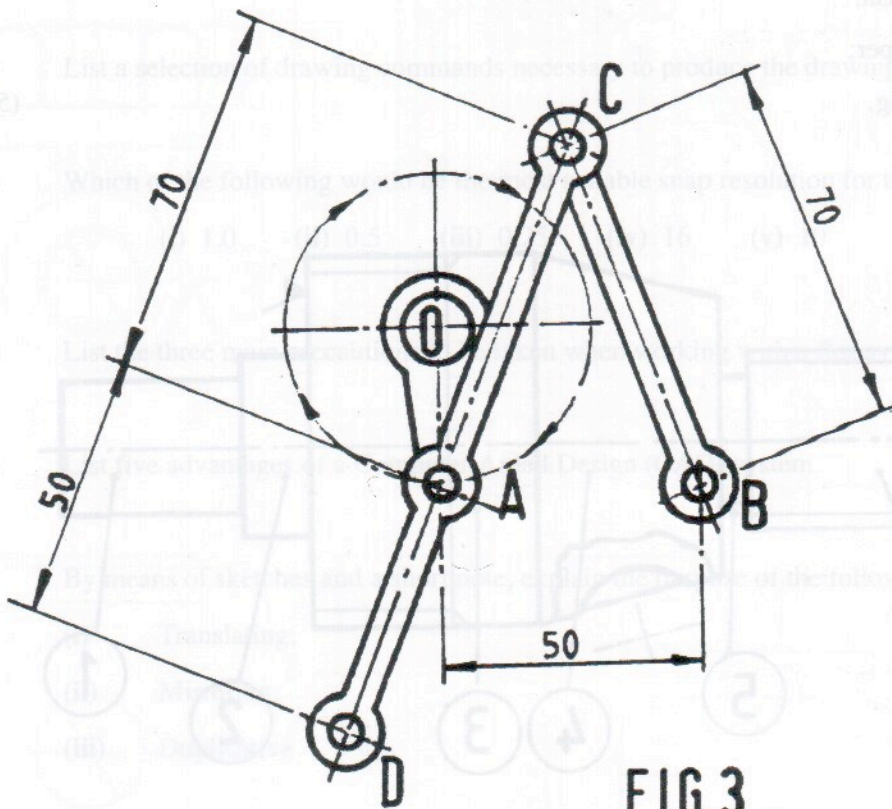


FIG. 3

(50 marks)

4. (a) Using the data table below, make a fully dimensioned drawing, showing all specifications machine part shown in Fig. 4. Use the shoulder indexed as a datum.

1	Square 30, Length 40
2	Diameter 40, Length 15
3	Diameter 80, Length 50, Screw thread: Metric 80, Pitch 5, Length 30
4	Maximum diameter 80, Minimum diameter 60, Woodruff keyway diameter 30, Depth 6 mid-length
5	Undercut: Depth 5, Length 5
6	Screw thread: Metric 40, Pitch 3.5, Length 50

- (b) (i) Identify the mechanism shown in Fig. 5.
 (ii) Name the parts 1, 2, 3, 4, 5.

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

- (i) Bush;
 (ii) Taper;
 (iii) Lug.

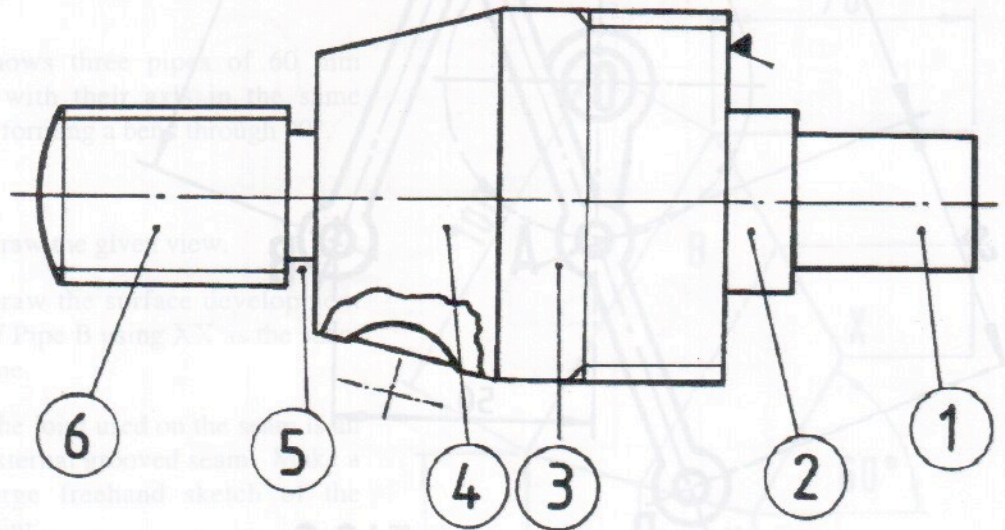


FIG.4

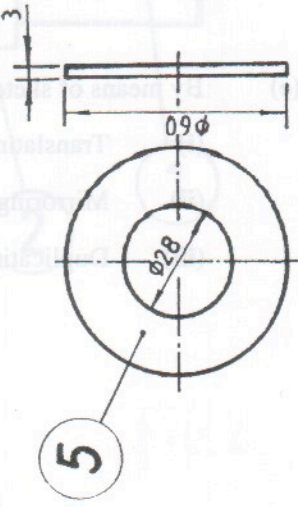
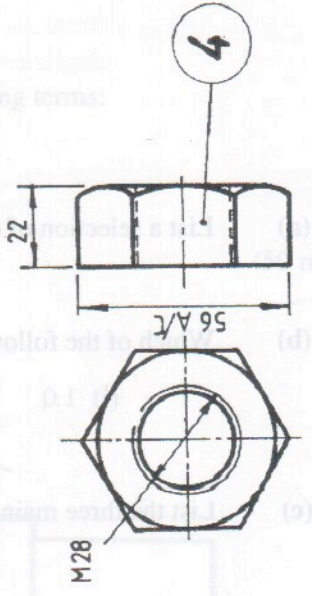
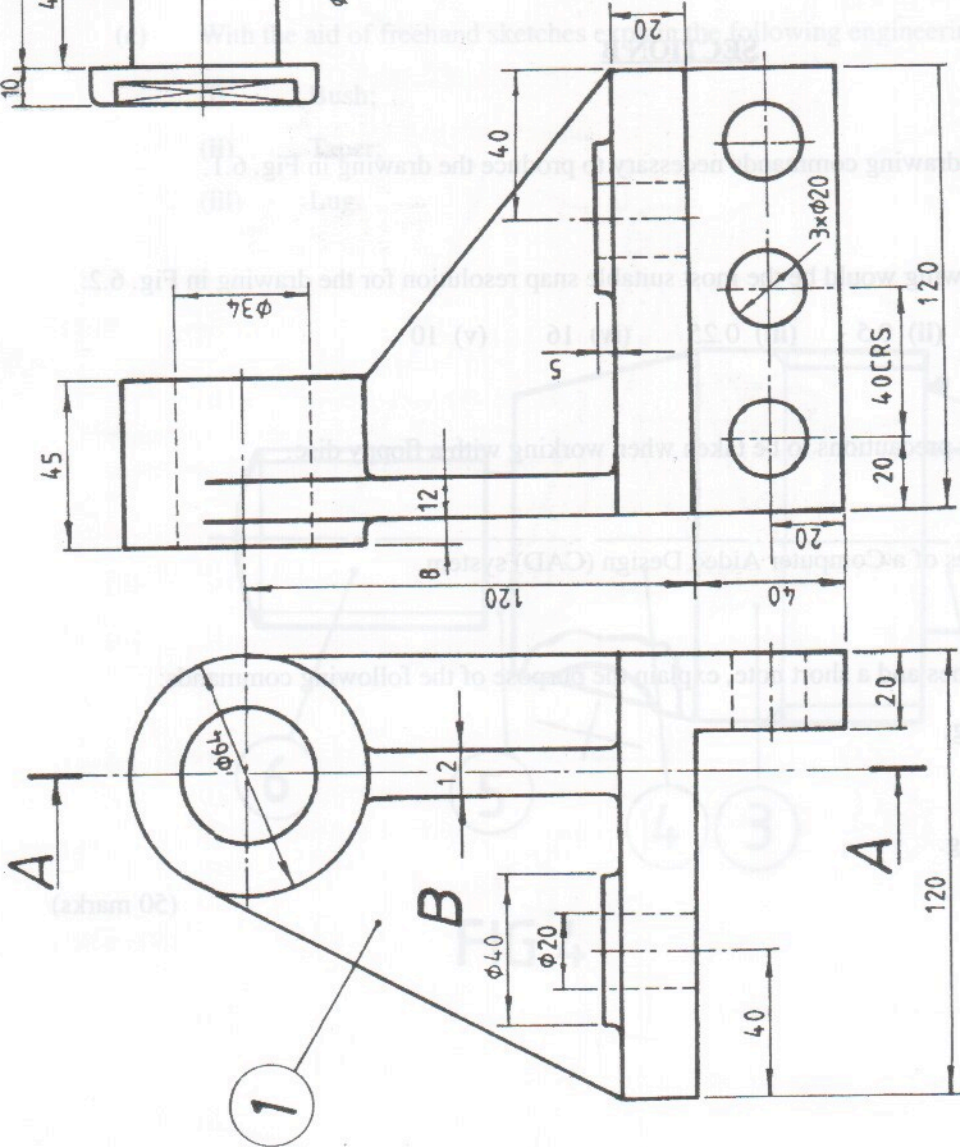
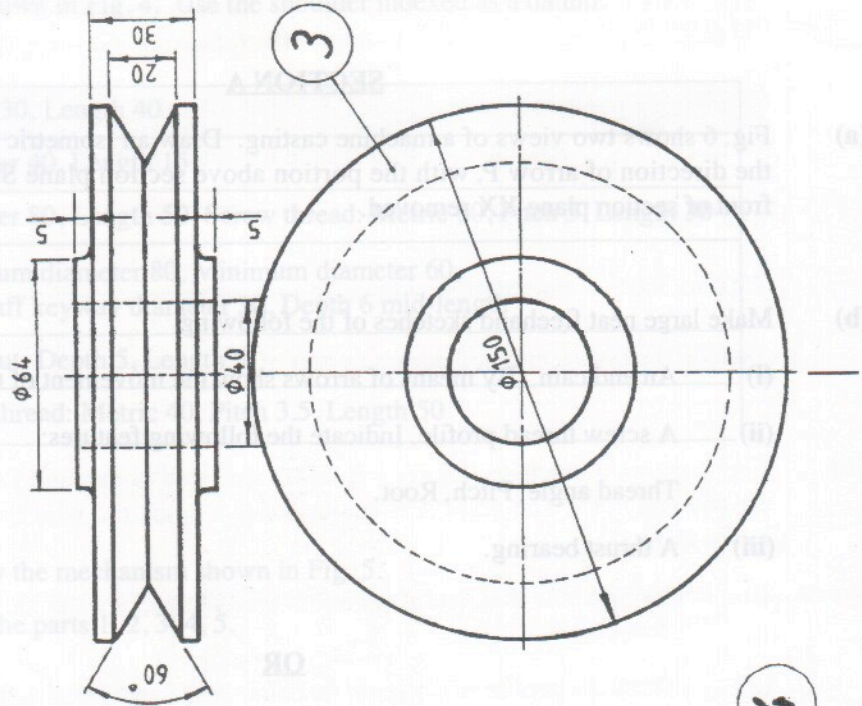
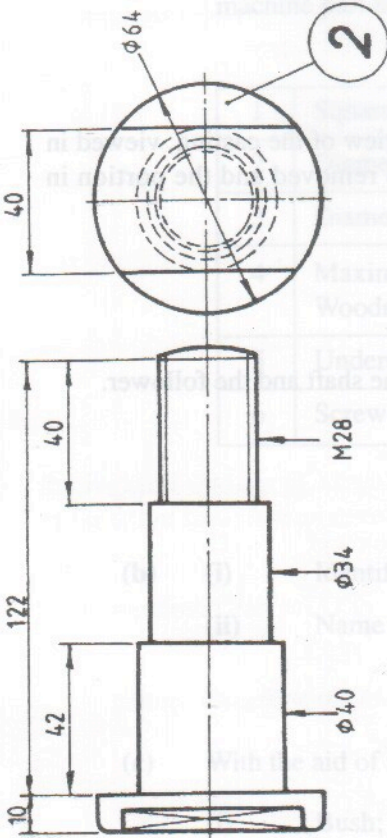
SECTION A

- (a) Fig. 6 shows two views of a machine casting. Draw an isometric view of the casting, viewed in the direction of arrow P, with the portion above section plane SS removed and the portion in front of section plane XX removed.
- (b) Make large neat freehand sketches of the following:
- An end cam. By means of arrows show the movement of the shaft and the follower.
 - A screw thread profile. Indicate the following features:
Thread angle, Pitch, Root.
 - A thrust bearing.

OR**SECTION B**

- (a) List a selection of drawing commands necessary to produce the drawing in Fig. 6.1.
- (b) Which of the following would be the most suitable snap resolution for the drawing in Fig. 6.2:
(i) 1.0 (ii) 0.5 (iii) 0.25 (iv) 16 (v) 10
- (c) List the three main precautions to be taken when working with a floppy disc.
- (d) List five advantages of a Computer Aided Design (CAD) system.
- (e) By means of sketches and a short note, explain the purpose of the following commands:
(i) Translating;
(ii) Mirroring;
(iii) Duplicating.

(50 marks)



PROJECTION

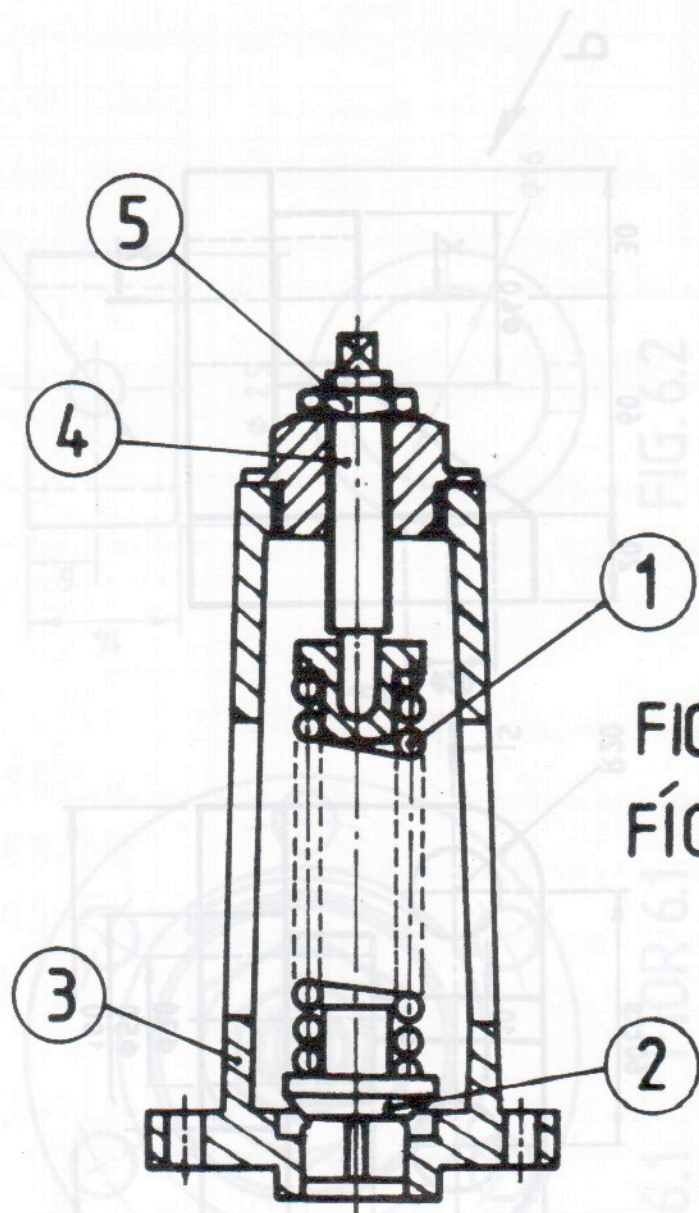


FIG. 5
FÍOR 5

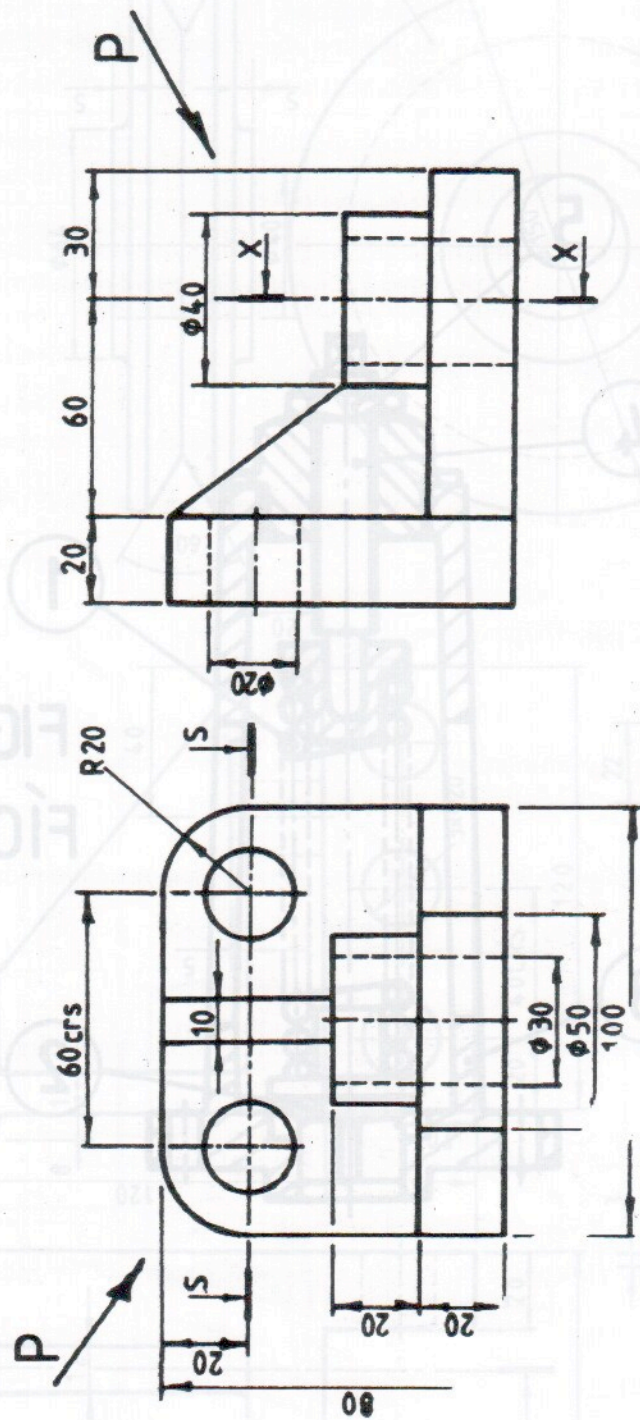


FIG. 6 FÍOR 6

PROJECTION
TEILGEAN

FÍOR 1

FIG 1

Details of a "Pipe Welding Clamp" are given in Fig. 1 with a parts list tabulated below.

1	Body	Rise 60mm with number six
2	Hinge	Pin 20mm with number six
3	Law	Pin 20mm with number six
4	Screw	Pin 20mm with number six
5	Spindle	Pin 20mm with number six
6	Clamp	Pin 20mm with number six

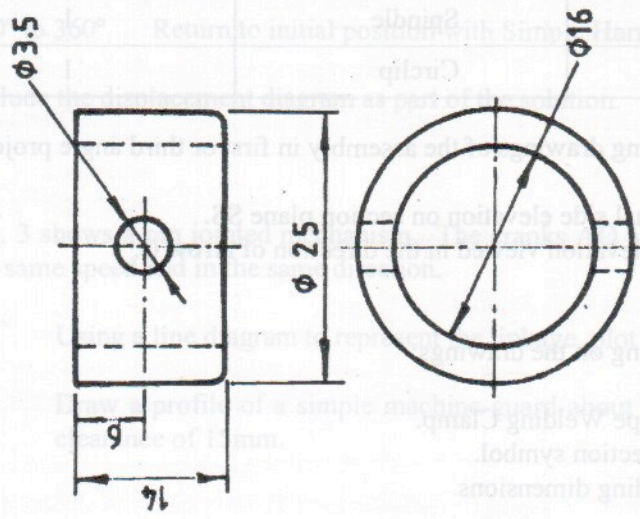


FIG. 6.2
FIOR 6.2

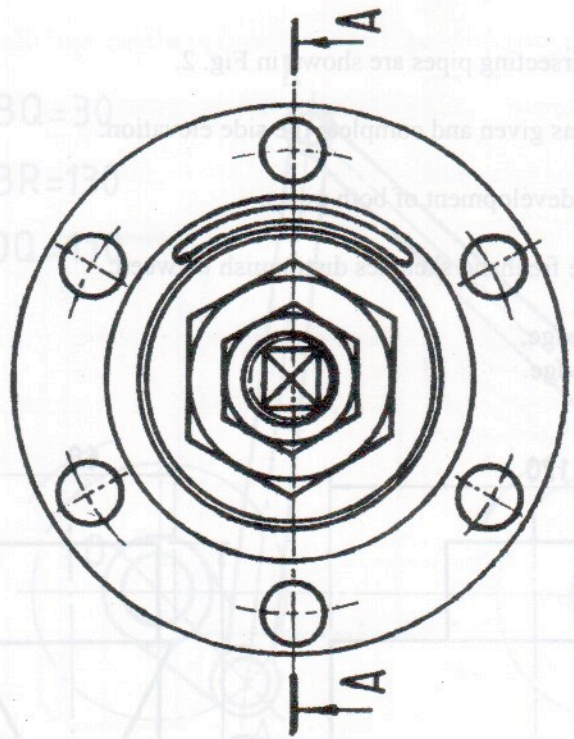


FIG. 6.1
FIOR 6.1