

3.21 DRAWING AND DESIGN (449)

3.21.1 Drawing and Design Paper 1 (449/1)

SECTION A (50 marks)

Answer **all** the questions in this section on the **A4** papers provided.

1. (a) Explain the difference between each of the following pair of terms: (4 marks)
 - (i) Artistic drawing and technical drawing;
 - (ii) Change and balance as used in hard cash transaction.
- (b) Define each of the following properties of materials: (3 marks)
 - (i) Malleability;
 - (ii) Toughness;
 - (ii) Brittleness.
2. With respect to computer aided drawings, give **three** advantages of electronic storage of drawings. (3 marks)
3. (a) With reference to drawing instruments: (2 marks)
 - (i) State a suitable method for testing the squareness of a Tee-square in a drawing room;
 - (ii) Name the method of sharpening a pencil lead tip to obtain suitable outlines.
- (b) Define each of the following terms as used in the **"steps in design"**: (3 marks)
 - (i) Design brief;
 - (ii) Design model;
 - (iii) Possible solution.
4. (a) Outline **four** factors to consider in order to ensure legibility of inclined lettering in a drawing. (2 marks)
- (b) Use a sketch to illustrate each of the following: (4 marks)
 - (i) To obtain A4 paper size from A2 paper size;
 - (ii) To find the centre of a given circle.

5. Construct a regular heptagon given that the length of one side is 30 mm. (5 marks)
6. Figure 1 shows the front elevation of a cone tilted at an angle.

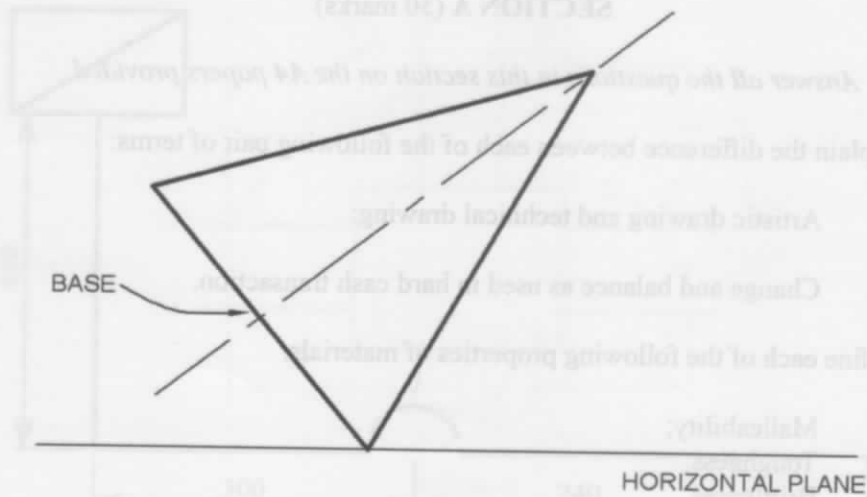


Figure 1

- Sketch in good proportion the end elevation and plan of the cone. (5 marks)
7. Construct a plain scale in which 30 cm represent 10 mm to read up to 50 mm. Show a reading of 23 mm. (3 marks)
8. Figure 2 shows two views of a block drawn in first angle projection. Sketch the block in two point perspective when the block is below the horizon. (5 marks)

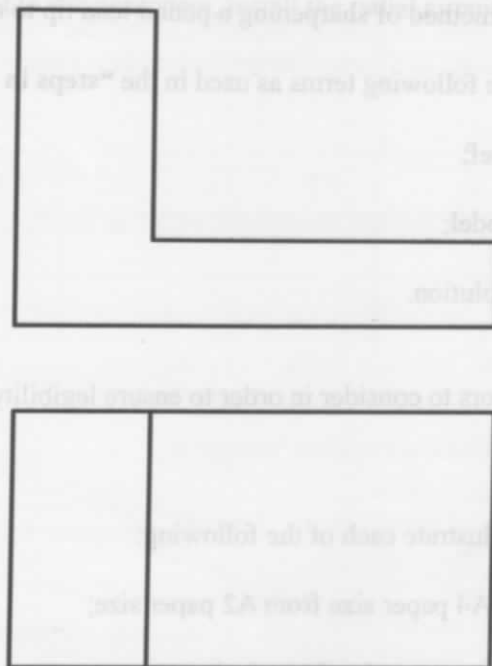


Figure 2

9. **Figure 3** shows the front elevation and plan of a casting drawn in first angle projection. In good proportion, sketch each of the following views: (5 marks)

- (a) Sectional front view on plane Y-Y;
- (b) Sectional plan on plane X-X.

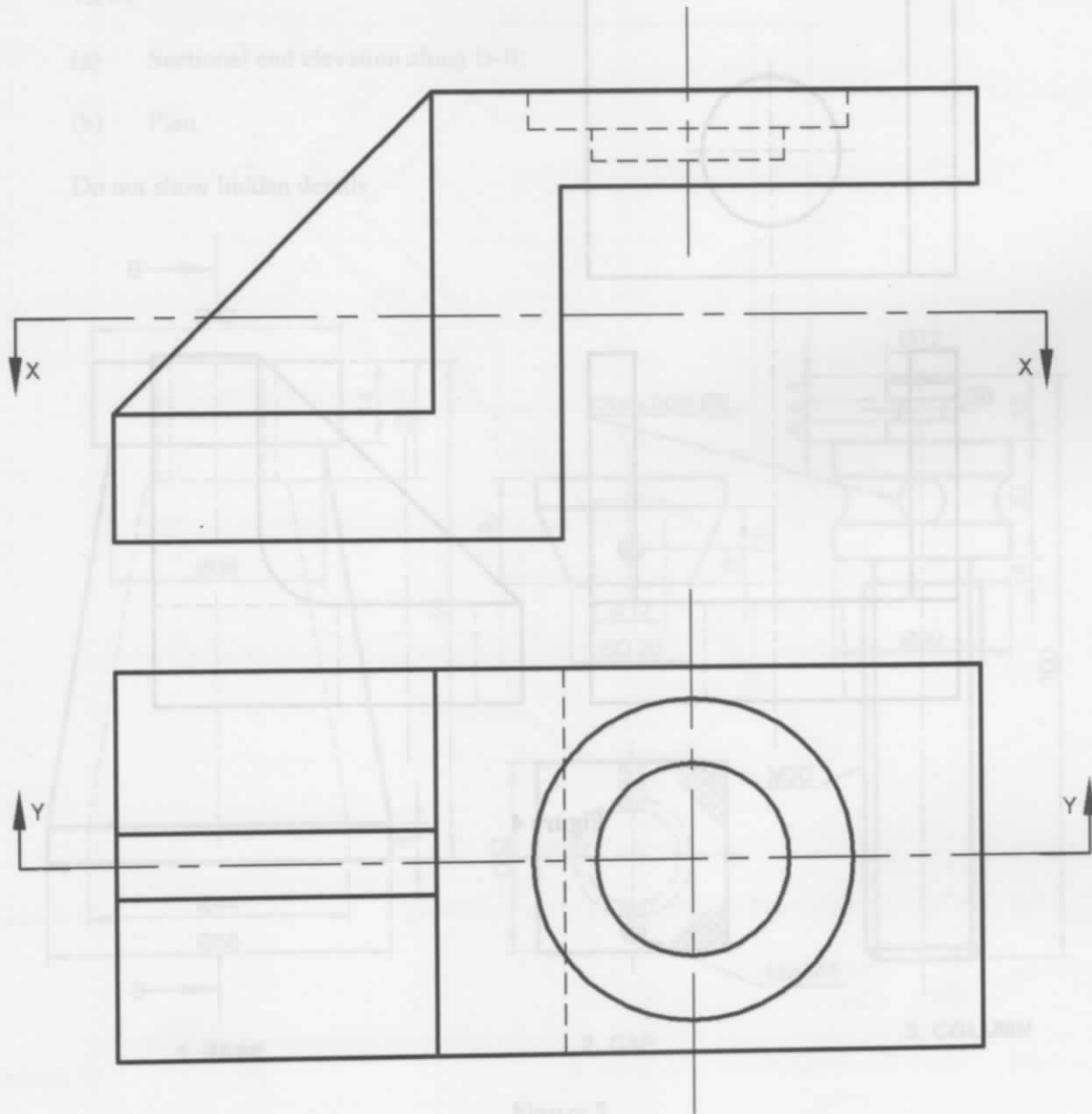
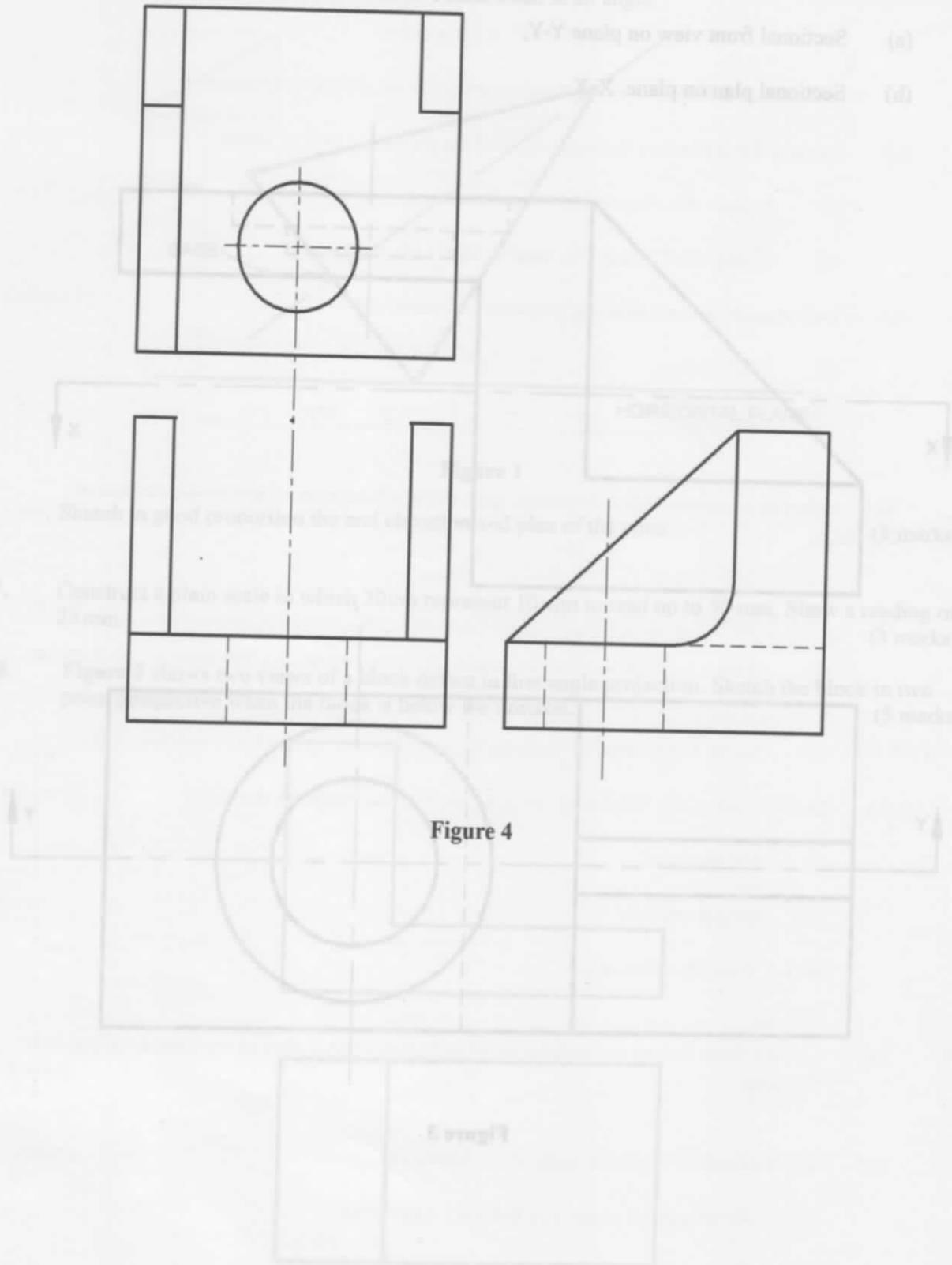


Figure 3

10. Figure 4 shows three views of a block drawn in third angle projection. Sketch the block in oblique projection. (6 marks)



SECTION B (20 marks)

*This question is compulsory.
Answer the question on the A3 paper provided.*

11. Figure 5 shows details of a screw jack. Assemble the parts and draw Full Size the following views: (20 marks)

- (a) Sectional end elevation along B-B;
- (b) Plan.

Do not show hidden details

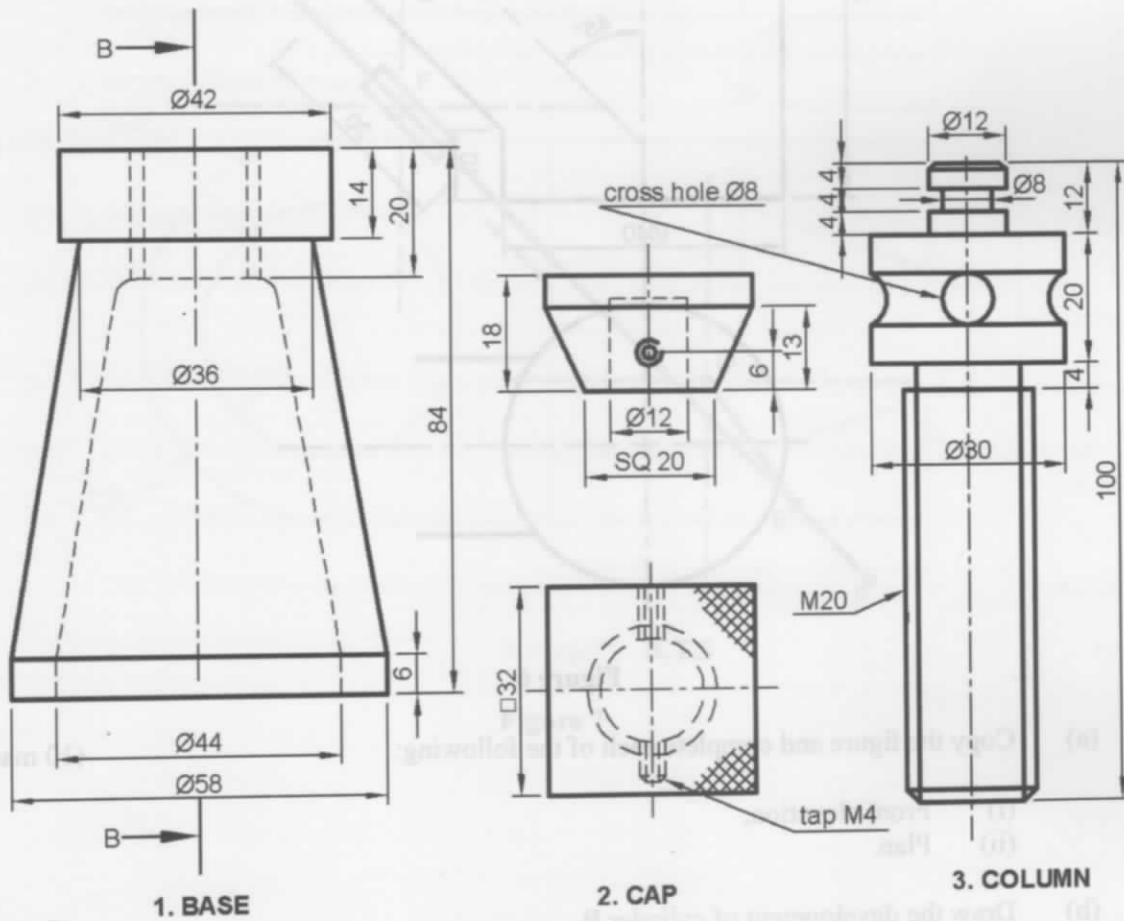


Figure 5

SECTION C (30 marks)

Answer any two questions from this section on the A3 paper provided.

12. Figure 6 shows an incomplete front elevation and plan of two intersecting cylinders.

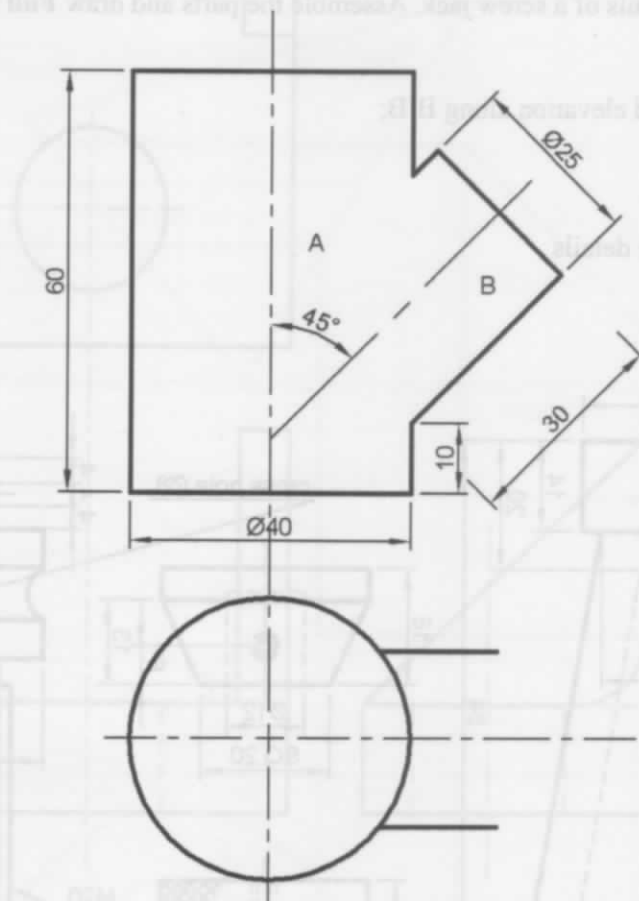


Figure 6

- (a) Copy the figure and complete each of the following: (10 marks)
- (i) Front elevation;
 - (ii) Plan.
- (b) Draw the development of cylinder B. (5 marks)

3.21.2 Drawing and Design Paper 2 (4-9-2)

13. Figure 7 shows the arrangement of a link mechanism. Crank OE rotates about centre O while rod GP slides back and forth through a guide pivoted at F.

Draw the locus of point P for one revolution of crank OE given the following dimensions:

Distance between vertical centrelines is 40

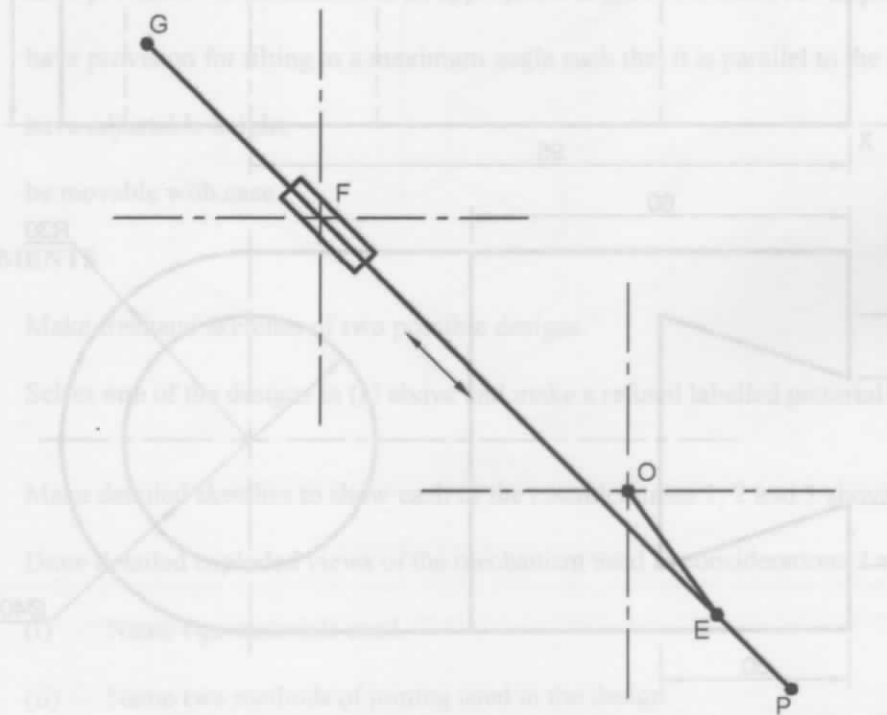
OE = 20

EP = 25

GF = 30

EF = 60

(15 marks)



N.T.S

Figure 7

14. Figure 8 shows two views of machined block drawn in first angle projection. Draw the block, Full Size in isometric projection taking X to be the lowest point. (15 marks)

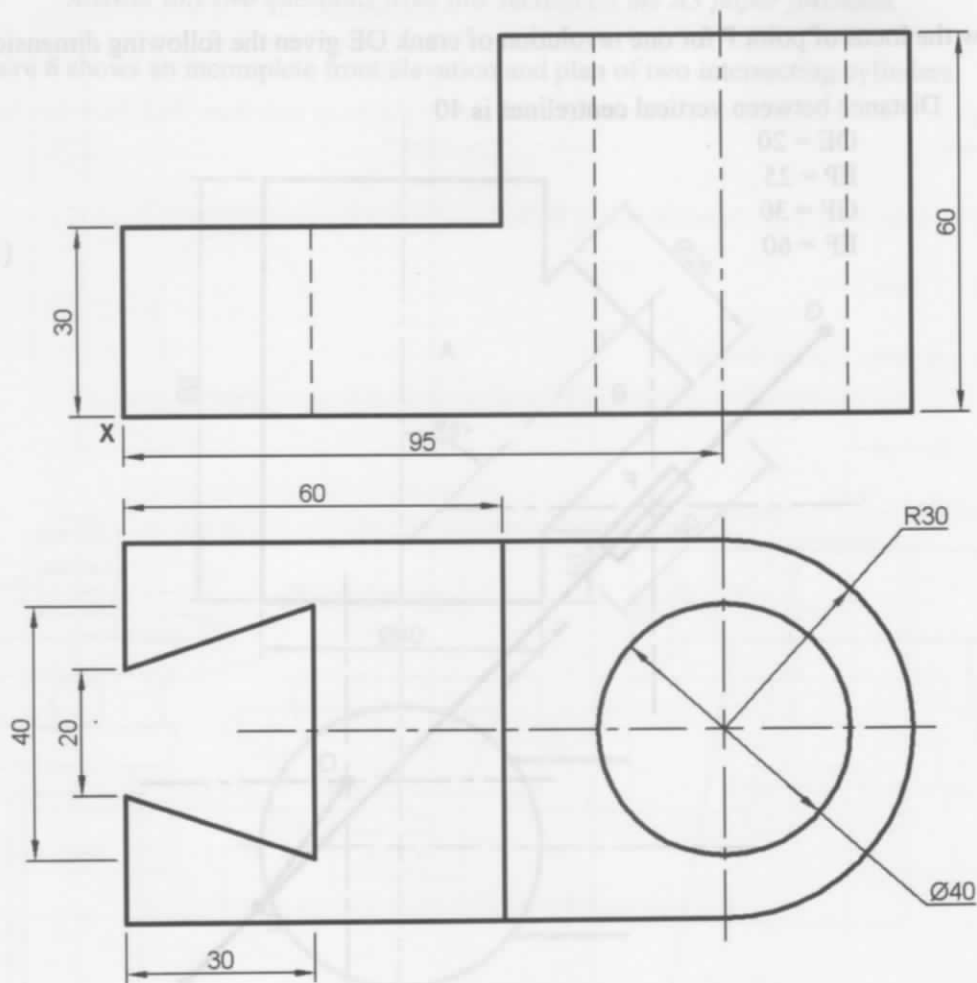


Figure 8

- (a) Copy the figure and complete each of the following (10 marks)
- Front elevation;
 - Plan.
- (b) Draw the development of cylinder B. (5 marks)