SECTION A (40 marks)

*Answer **all** the questions in this section on the answer sheets provided.*

1 (a) State the use and **one** advantage of each of the following drawing papers:

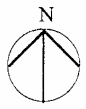
(i) grid
(ii) tracing (2 marks)

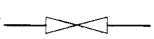
(b) State the title and role of a person with the following qualification in a design office:

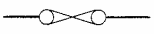
(i) degree in civil engineering;
(ii) diploma in civil engineering. (2 marks)

2 (a) List **three** principles of design. (1 ½ marks)

(b) State the meaning of each of the symbols shown in figure 1.

(i) 

(ii) 

(iii) 

(iv) 

Figure 1 (2 marks)

3 Explain each of the following methods of joining metals:

(a) soft soldering;

(b) brazing;

(c) welding. (3 marks)

4 Figure 2 shows two views of a block in third angle projection.

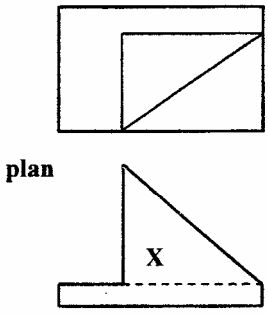


Figure 2

Sketch an oblique view of the block with **X** and the nearest face. (4 marks)

5 Construct a four sided polygon ABCD with side to length ratios of 2:1 : 2.5:1.5 and a perimeter of 210 mm given that angle ABC is 90°. Measure the smallest angle. (3 marks)

6 Construct a diagonal enlargement scale of 2:1 to measure to an accuracy of 0.5mm up to 60mm. Show the readings of 51.5 and 26.5 mm on the scale. (4 marks)

7 (a) Figure 3 shows an elevation of a template.

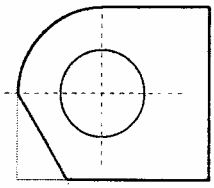


Figure 3

Measure and dimension the:
(i) circle;
(ii) radius;
(iii) angle of the slanting face. (3 marks)

(b) On the perspective grid provided, sketch a two point perspective of the block shown in figure 4. (3 marks)

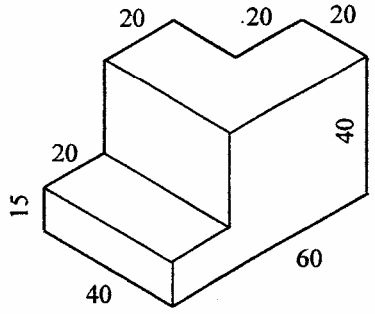


Figure 4

8 Construct a regular heptagon (seven-side polygon) whose sides are 25mm. (4 marks)

9 Figure 5 shows three views of a block in first angle projection.

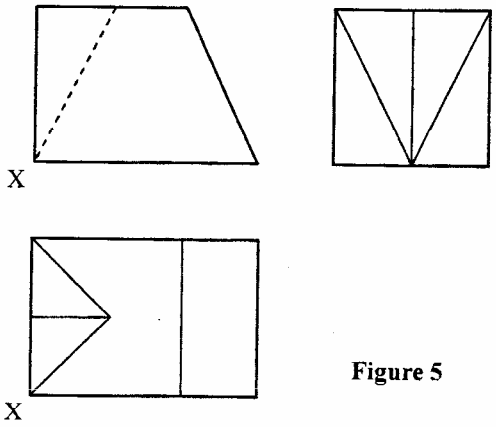


Figure 5

Sketch the isometric view of the block taking **X** as the lowest point. ($3\frac{1}{2}$ marks)

10 Figure 6 shows an isometric drawing of a strapped block.

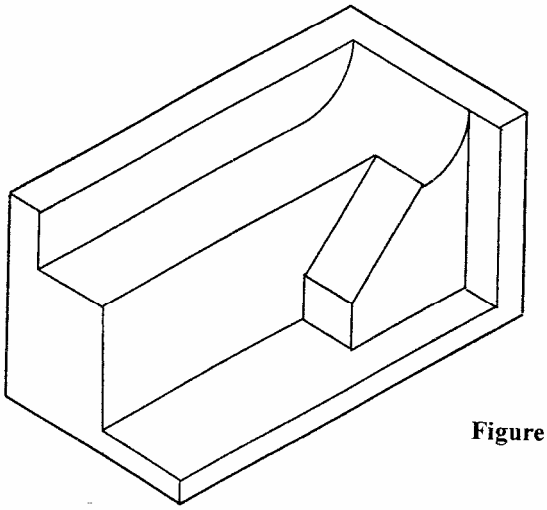


Figure 6

Sketch the front elevation and plan of the block in third angle projection. (5 marks)

SECTION B (30 marks)

*Question 11 is **compulsory**.*

*Candidates are advised to spend **not more than one hour** on this question.*

11 Figure 7 shows parts of a bearing bracket drawn in third angle projection. Assemble the parts and draw FULL SIZE the following:

(a) Sectional front elevation along the cutting plane C - C.
(b) End elevation in the direction of arrow D. Insert **four** leading dimensions.

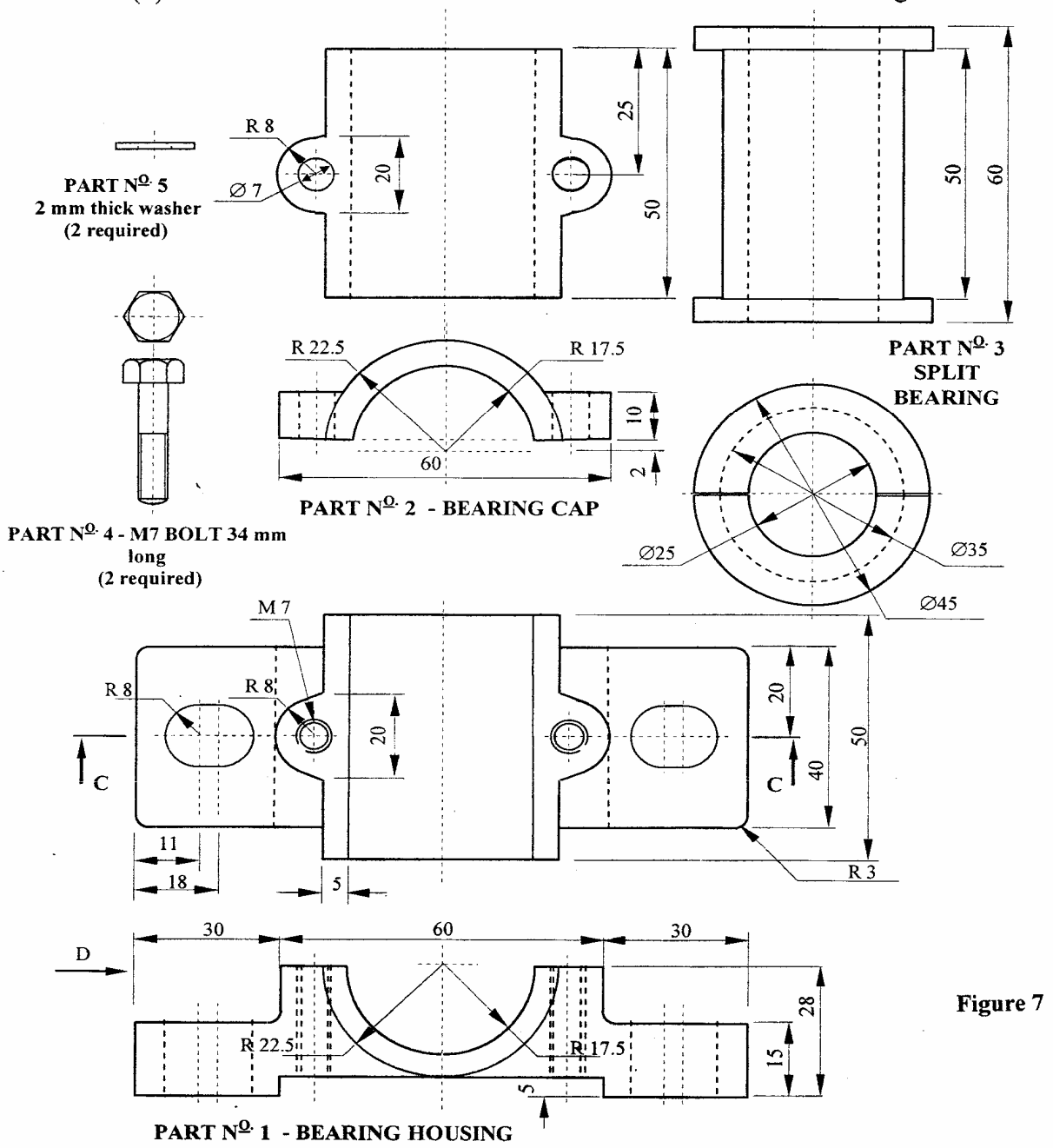


Figure 7

SECTION C (30 marks)

*Answer any **two** questions from this section.*

12 Figure 8 shows a feed hopper in the form of a square pyramid truncated along Y - Y and Z - Z.

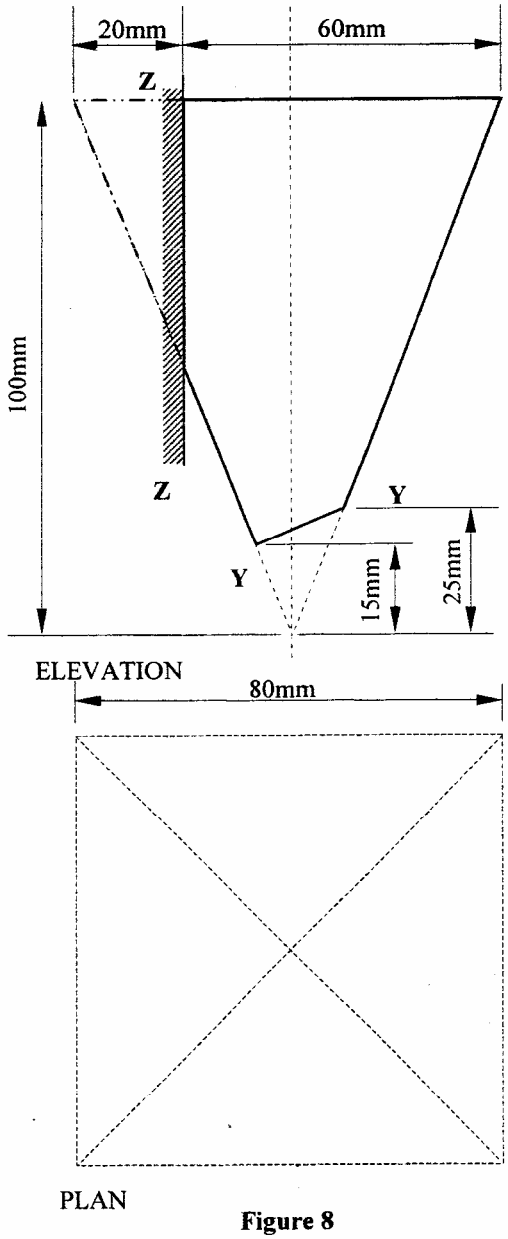


Figure 8

(a) Copy the given view and complete the plan.
(b) Draw the surface development of the hopper. (15 marks)

13 Figure 9 shows an isometric view of a machined block.

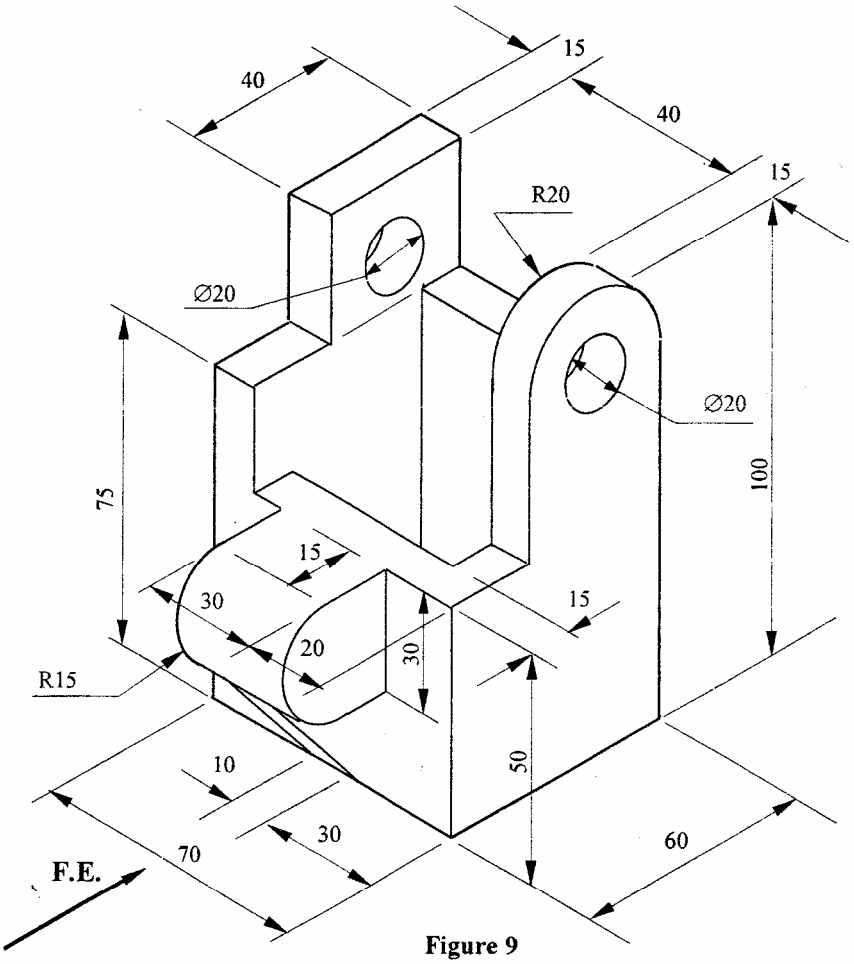


Figure 9

Draw FULLSIZE in third angle projection the three orthographic views of the block.

(15 marks)

14 Figure 10 shows a floor plan of a house.

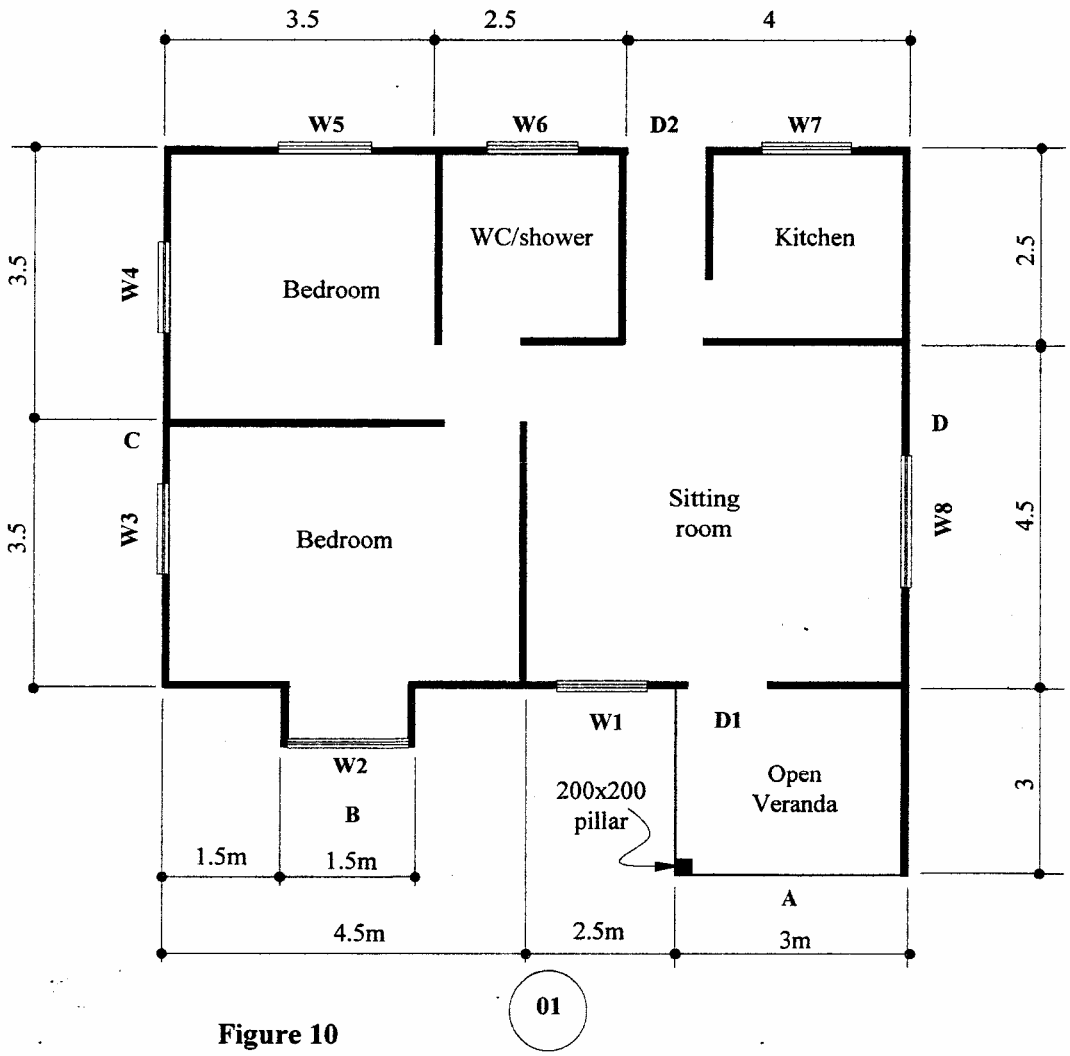


Figure 10

Given the following specifications, draw to a scale of 1:100 the following views:

(a) Elevation 01
(b) Roof plan showing valley, hip and ridge lines.

Specifications:
End **A** and **B** gabbled
End **C** and **D** hipped
Floor to ceiling height is 2.8m
Roof of equal pitch of 30°

Doors and window schedule:
W_1 1200 x 1200 steel casement
W_2 1000 x 1000 steel casement
D_1 1000 x 2000 steel casement

(15 marks)