

4.7 DRAWING AND DESIGN (449)

4.7.1 Drawing and Design Paper 1 (449/1)

SECTION A (50 marks)

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

1. (a) Outline **three** qualities of an entrepreneur. (3 marks)  
(b) State **four** characteristics of a good technical drawing paper. (2 marks)
2. (a) Name **two** instruments used for drawing vertical lines. (1 mark)  
(b) State **two** uses of dividers in technical drawing. (2 marks)
3. **Figure 1** shows an engineering template drawn by utilizing six types of lines labelled A–F.

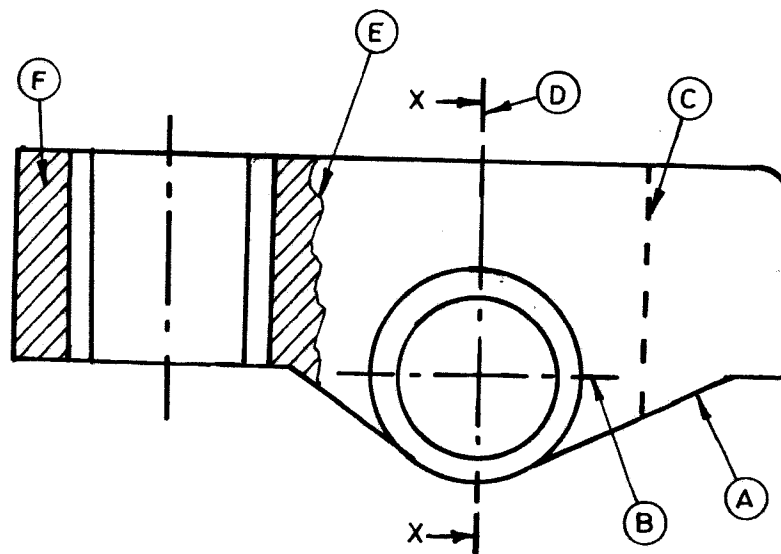
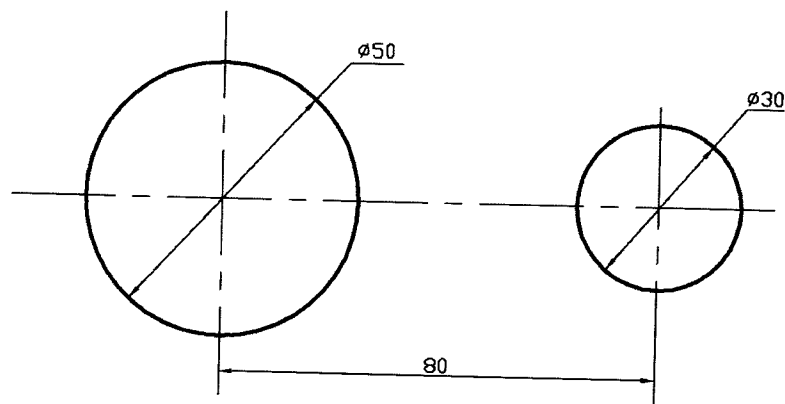


Figure 1

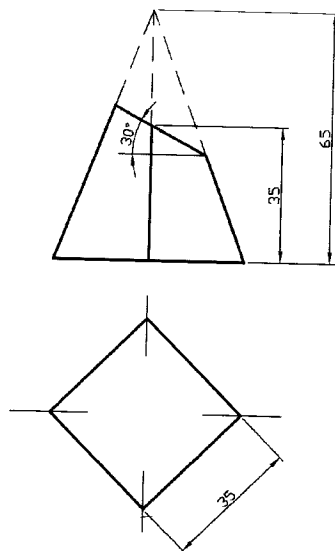
- (a) Name the types of lines.
- (b) State the use of each line. (3 marks)

4. (a) State **three** classifications of metals and give **one** example of each. (3 marks)
- (b) Construct an internal tangent to touch the circles shown in **Figure 2** (3 marks)



**Figure 2**

5. (a) Use sketches to describe **three** types of dimensions in drawing. (3 marks)
- (b) Construct a diagonal scale in which 30 mm represent 1 km to read up to 4 km. Indicate a distance of 2.84 km on the scale. (5 marks)
6. **Figure 3** shows the front elevation and incomplete plan of a truncated square pyramid. Complete the plan and draw the true shape of the cut face. (5 marks)



**Figure 3**

7. Make pictorial sketches of the following fastening devices: (6 marks)
- (a) Gib head key.
  - (b) Woodruff key.
  - (c) Feather key.
8. List six computer programmes used to produce technical drawings. (3 marks)
9. Figure 4 shows a simple shaped block drawn in isometric projection.

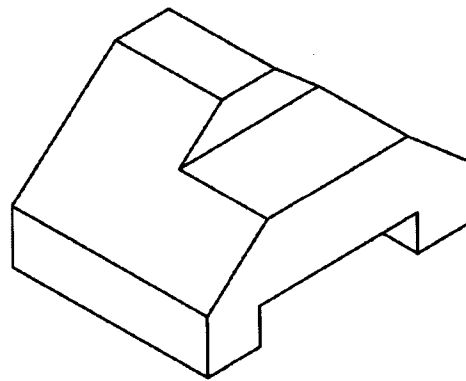


Figure 4

Draw the front elevation and plan of the block in first angle projection. (6 marks)

10. Figure 5 shows three views of a block drawn in third angle projection.

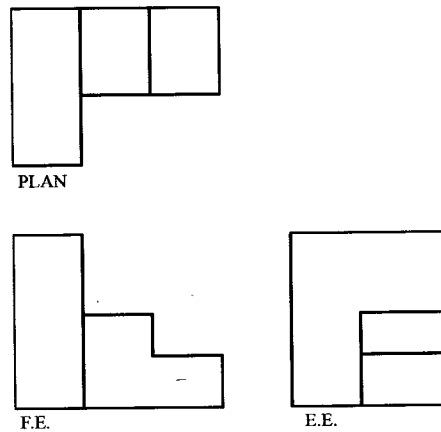


Figure 5

Draw the block in oblique cavalier projection. (5 marks)

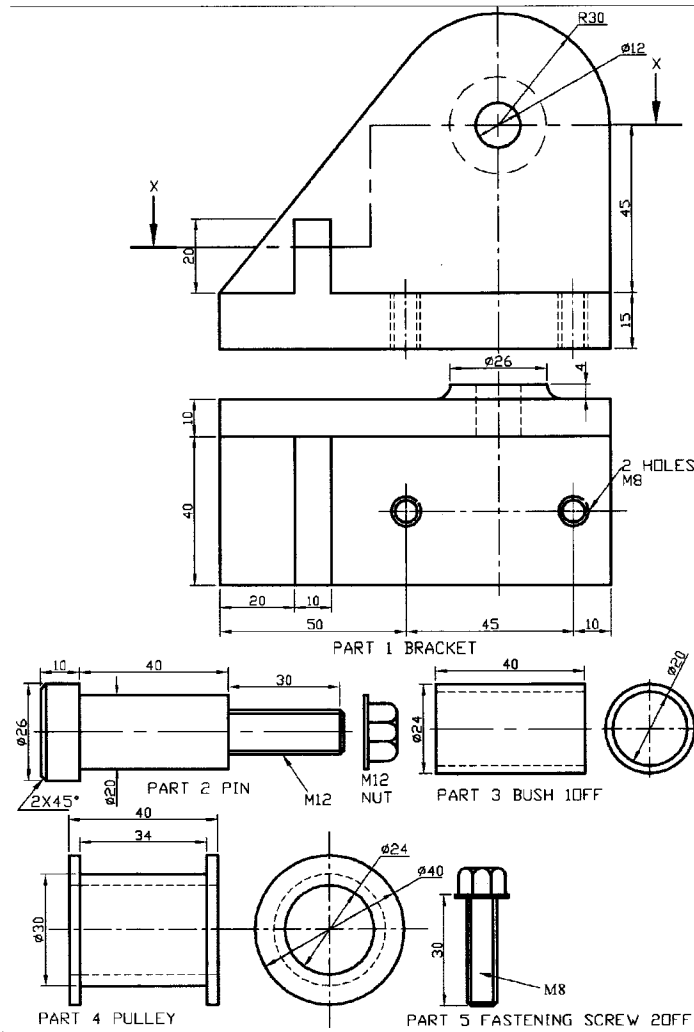
**SECTION B (20 marks)**

*This question is compulsory.*

*It should be answered on the A3 paper provided.*

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

11. **Figure 6** shows parts of a pulley bracket drawn in first angle projection.



**Figure 6**

Assemble the parts and draw Full Size the following views in first angle projection:

- (a) Front elevation
- (b) Sectional plan along the cutting plane X-X.

(20 marks)

*Do not include hidden details.*

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SECTION C (30 marks)

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

12. **Figure 7** shows two views of an axle boss drawn in first angle projection. Draw the boss in isometric projection taking X as the lowest point. (15 marks)

Include six dimensions.

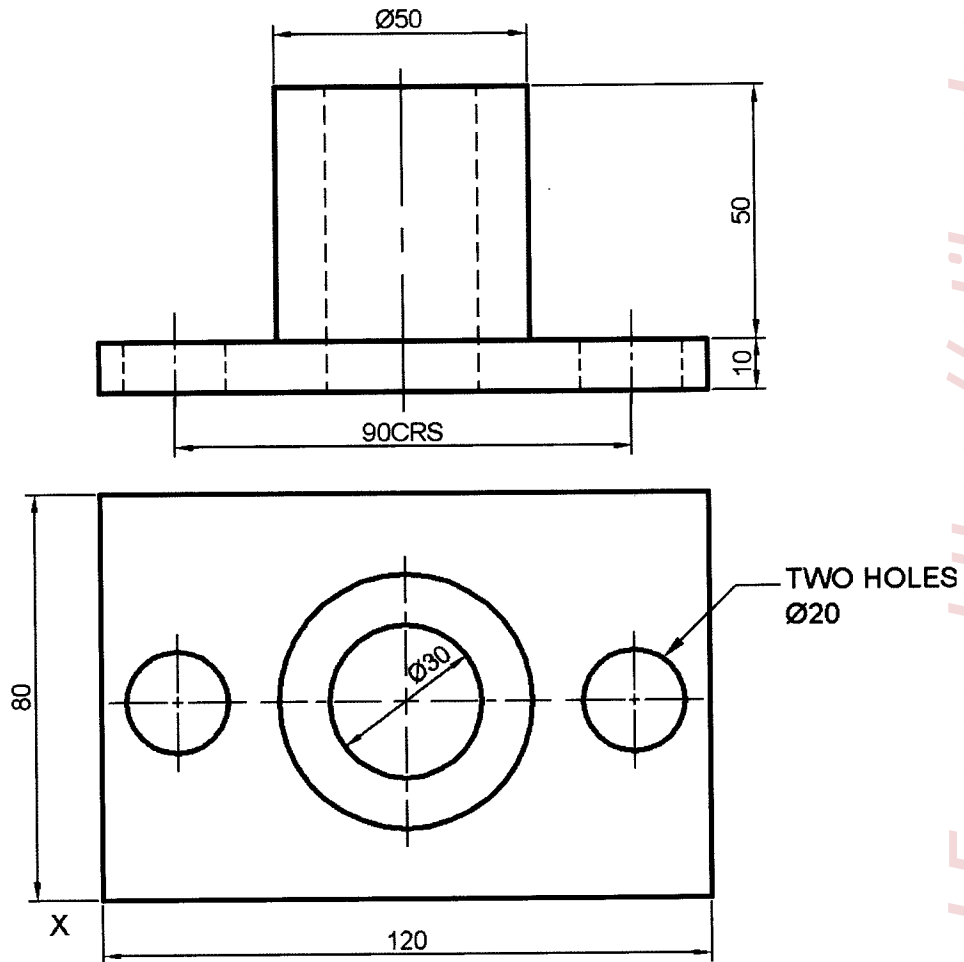
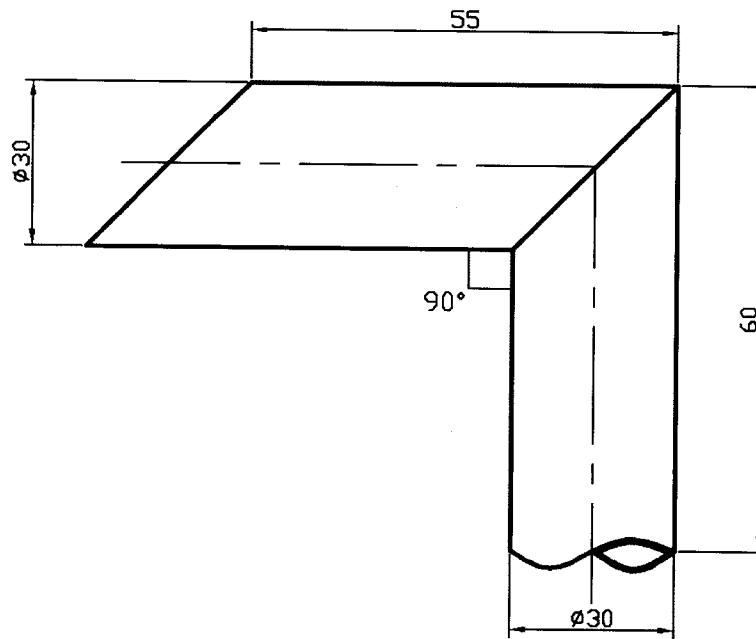


Figure 7

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13. **Figure 8** shows an elevation of a joint formed by two pipes A and B at a right angle. Draw the development of the pipes. (15 marks)



**Figure 8**

14. An archimedean spiral has its nearest point 15 mm from the centre (pole) and the furthest point 85 mm from the centre. Draw the spiral. (15 marks)

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