

3.22 DRAWING AND DESIGN (449)

3.22.1 Drawing and Design Paper 1 (449/1)

SECTION A (50 marks)

Answer all questions in this section on the answer sheet provided.

- 1 (a) State **three** roles of the National Industrial Training Authority (NITA). (3 marks)
- (b) Name **two** methods of sharpening pencils leads and state where each is applied in technical drawing. (2 marks)
- 2 Sketch the conventional symbol for each of the following as used in drawing: (3 marks)
- (a) Planned timber.
- (b) Third angle projection.
- (c) Earth wire.
- 3 (a) State **two** advantages of plywood over solid timber. (2 marks)
- (b) State **two** factors that relate to the quality of a design with regard to the following:
- (i) Material.
- (ii) Proportion. (2 marks)
- 4 **Figure 1** shows a simple shaped block drawn full size in isometric projection.

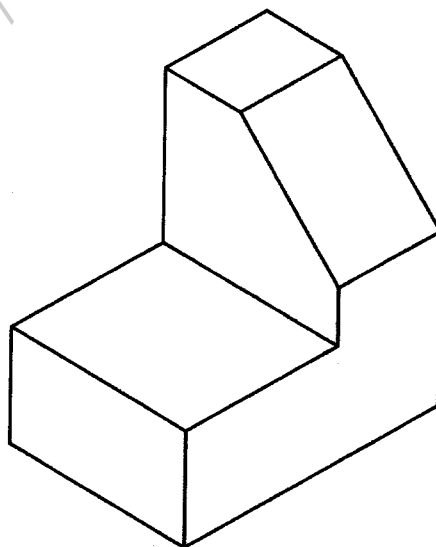


Figure 1

Copy the figure and dimension it fully.

(4 marks)

- 5 (a) State **two** reasons why care must be taken when storing drawing instruments. (1 mark)
- (b) Name **four** components of a computer and state the use of each. (4 marks)
- 6 **Figure 2** shows a truncated hexagonal pyramid whose distance across corners is 50 mm.

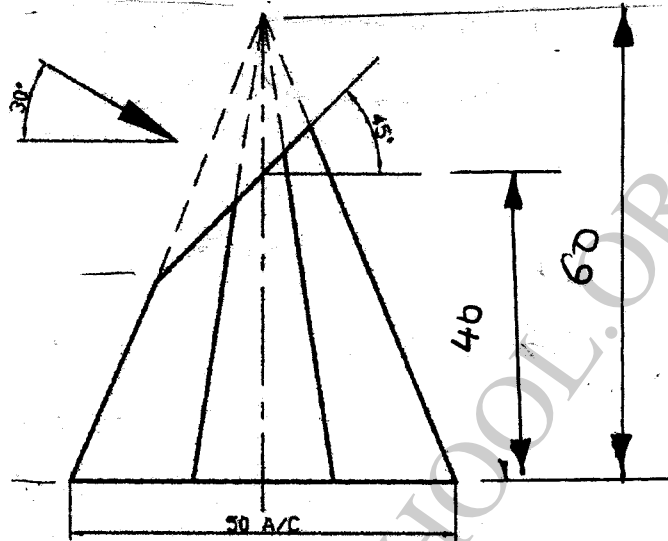


Figure 2

Copy the figure and draw the following: (7 marks)

- (a) Complete plan.
- (b) Auxillary view as seen in the direction of arrow shown.
- 7 Construct an involute of a square whose side is 35 mm. (5 marks)
- 8 **Figure 3** shows a diagonal scale.

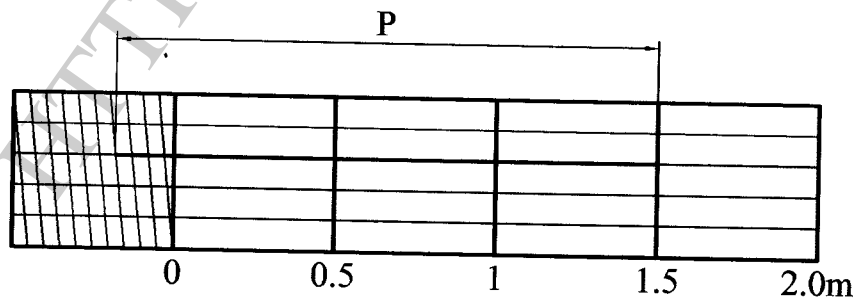


Figure 3

- (a) Determine the accuracy of the scale. (1 mark)
- (b) Outline the steps to follow in order to obtain reading "P". (4 marks)

9 **Figure 4** shows a shaped block drawn in isometric projection.

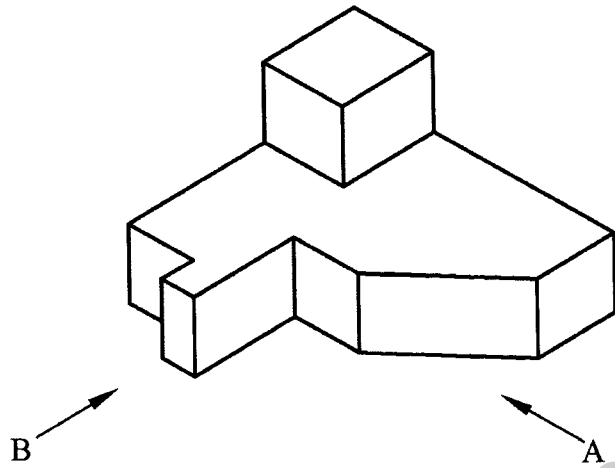


Figure 4

Sketch in good proportion the following views in first angle projection:

(6 marks)

- (a) Front elevation in the direction of Arrow A.
- (b) End elevation in the direction of Arrow B.
- (c) Plan.

10 **Figure 5** shows two views of a solid block drawn in first angle projection.

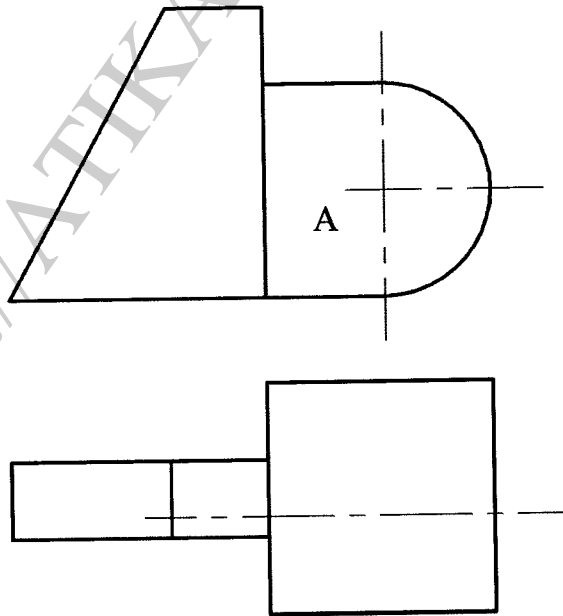


Figure 5

In good proportion draw the block in oblique projection with A as the front face.

(6 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 tool post drawn in first angle projection. Assemble the parts and draw full size the following views in third angle projection:

- (a) Sectional front elevation along the cutting plane X-X.
- (b) Plan.

Insert **four** leading dimensions and do not show hidden details.

(20 marks)

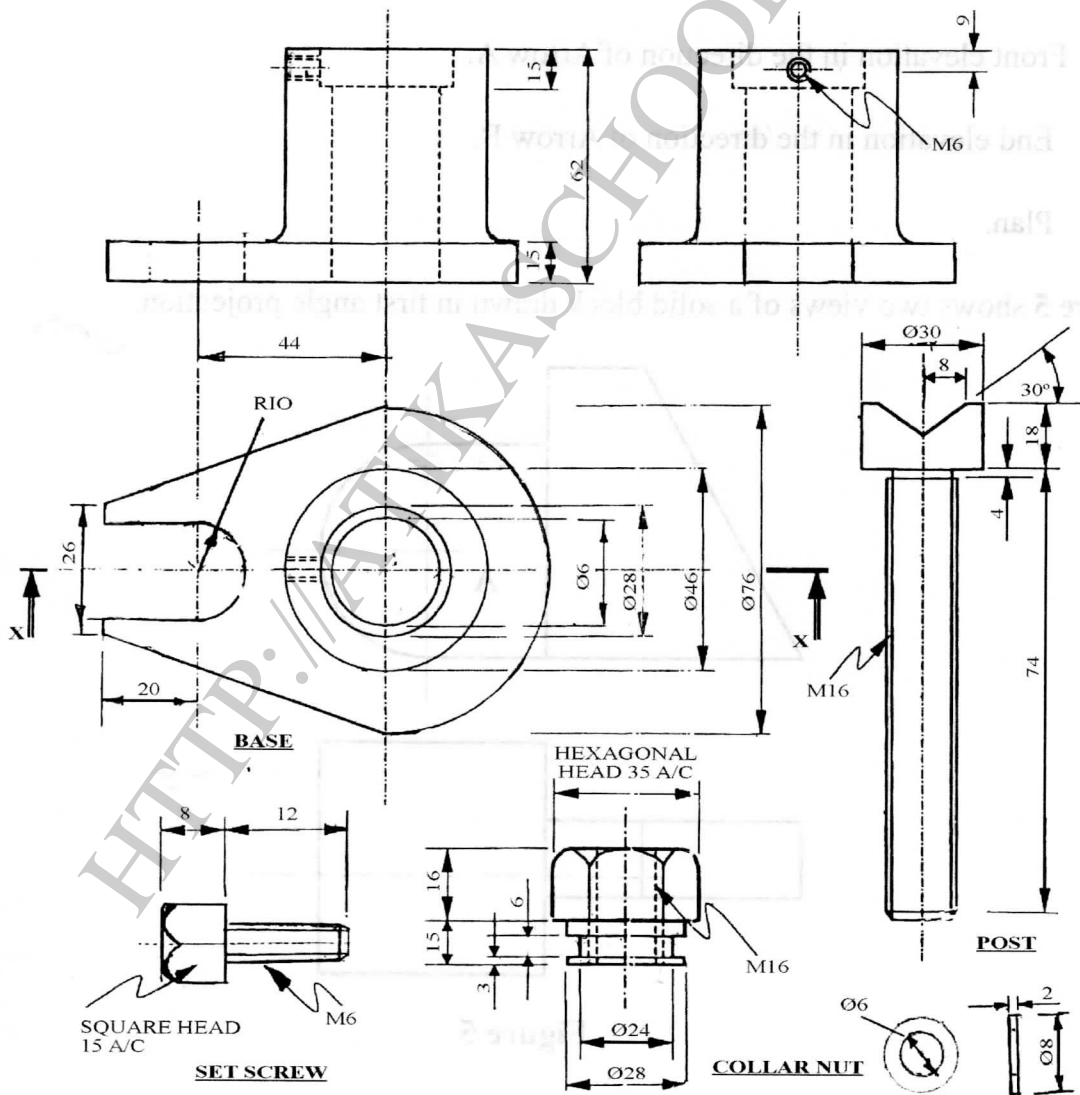


Figure 6



SECTION C (30 marks)

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

- 12 **Figure 7** shows a link mechanism in which AB rotates about A while C oscillates about point D. Plot the locus of point E as AB makes one complete revolution. (15 marks)

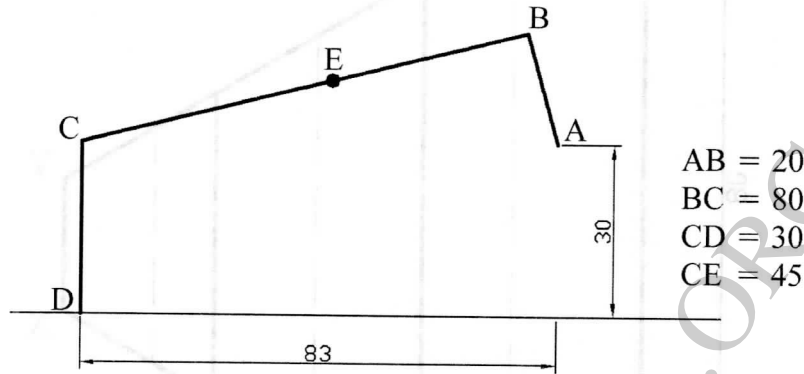


Figure 7

- 13 **Figure 8** shows a machine block drawn isometric projection.

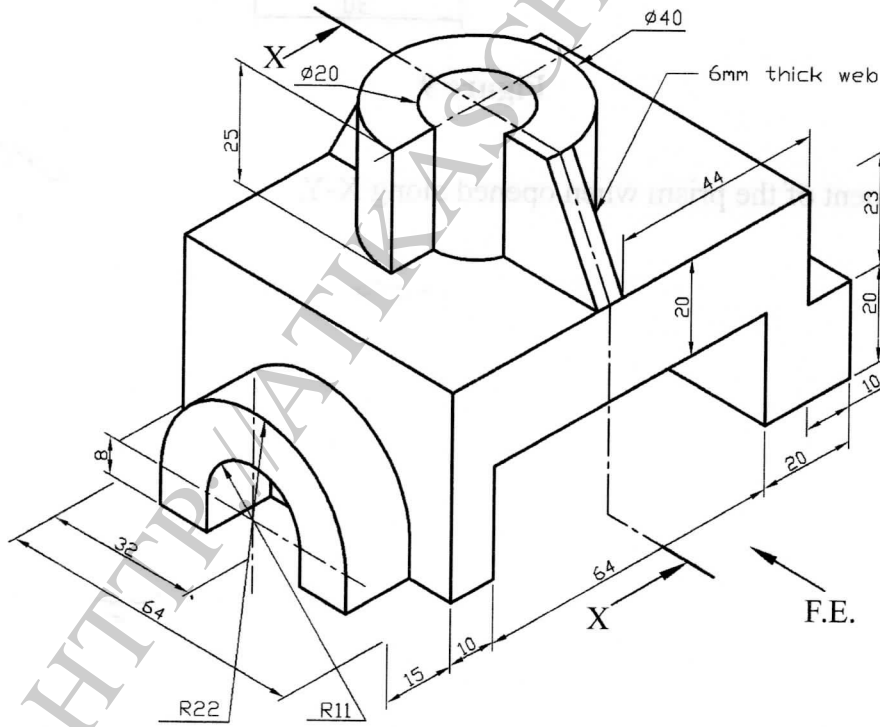


Figure 8

Draw **Full Size** the following views in first angle projection: (15 marks)

- Front elevation in the direction of arrow F.E.
- Sectional end elevation along the cutting plane X-X.
- Plan.

- 14 **Figure 9** shows the front elevation of a truncated heptagonal prism, whose length of base is 30 mm.

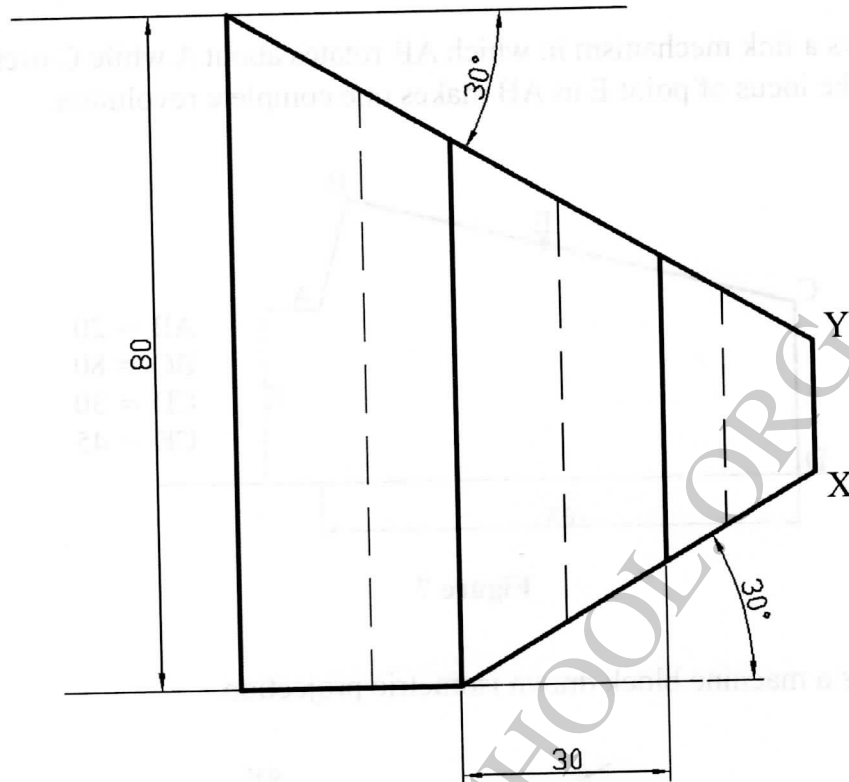


Figure 9

Draw the development of the prism when opened along X-Y.

(15 marks)

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