Question 1.

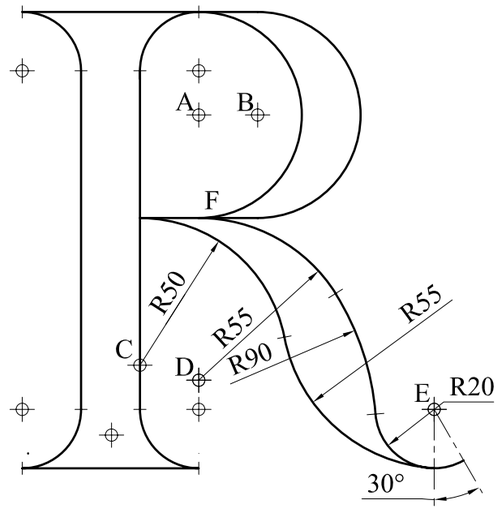
The figure on the right shows a simplified classic Roman typeface of the letter **R**.

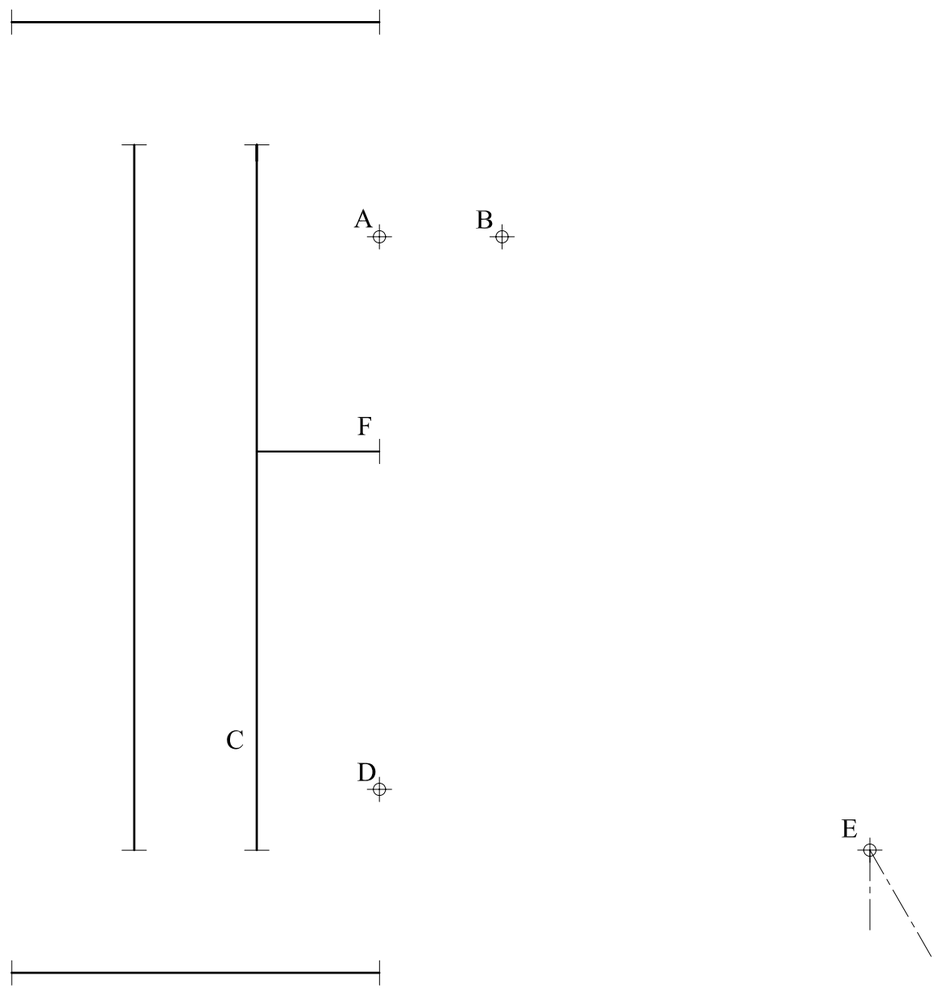
Using the start lines given below and to the given dimensions, construct geometrically the typeface. All constructions to locate the centres and the points of tangencies are to remain visible.

Notes:

1. *A and B are the centres of two equal semi circles.*
2. *Centre C lies on the vertical line marked C.*
3. *D is the centre of the R55 arc.*
4. *E is the centre of the R20 arc.*
5. *F is a tangential point of semi circle A and arc D.*
6. *The vertical and horizontal start lines given below are all tangents to the respective arcs in contact.*

12 marks





Question 2.

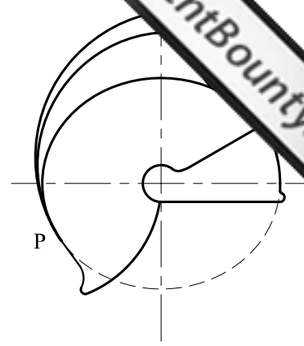
A simplified version of a classic Roman helmet is shown on the right.

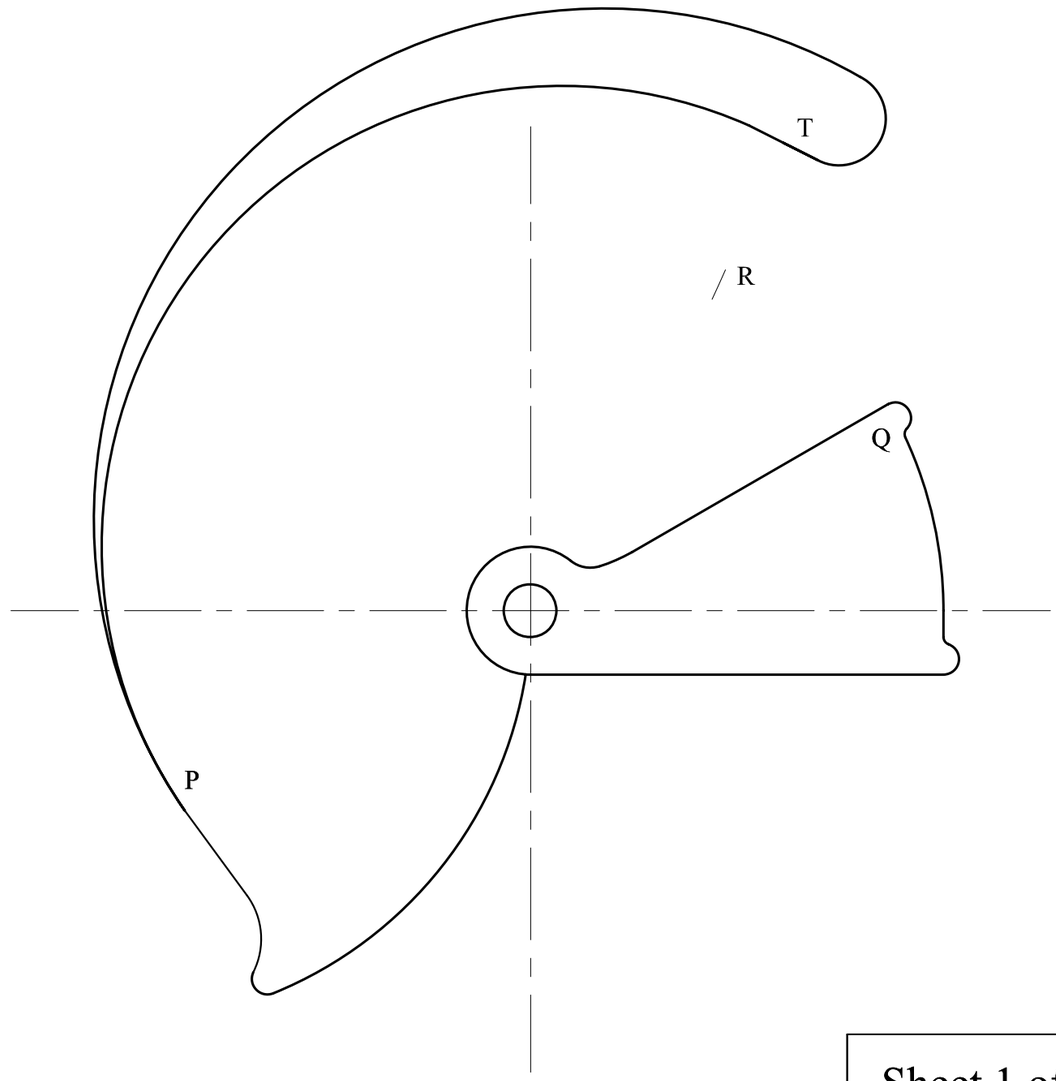
An incomplete version of the helmet is given below.

Using the given start lines, complete the drawing by constructing:

a. A part ellipse PQ (major axis 134mm, minor axis 120mm).
b. A normal to the ellipse at point R and extending to T.
c. A semi circle RT having its centre lying on normal RT.

12 marks





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Question 3.

The figures show two versions of a geometric pattern which is composed of **equilateral triangles** and **arcs**. All the construction lines of pattern 'A' have been left visible. Pattern 'B' is the completed version. You are asked to analyze carefully pattern 'A' and:

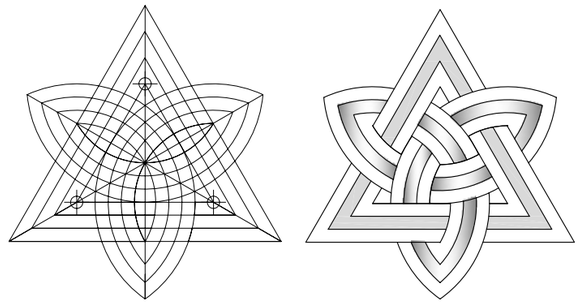
a) reconstruct the design on the given start lines,

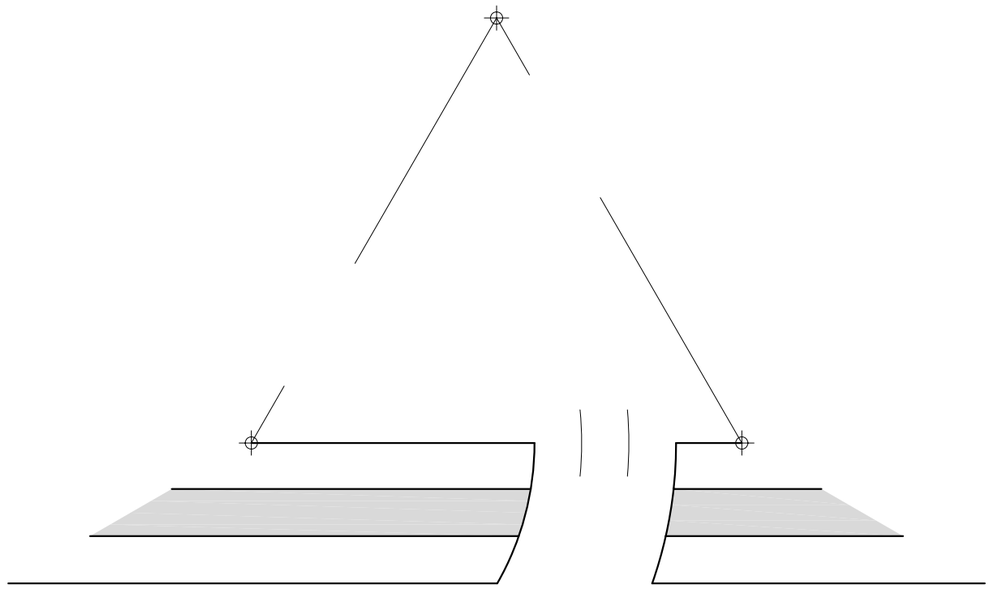
b) neatly render the shaded areas using suitable colours.

Note: The centres of the arcs lie on the corners of the smallest equilateral triangle (given below).

12 marks

'A' 'B'





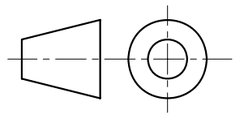
Question 4.

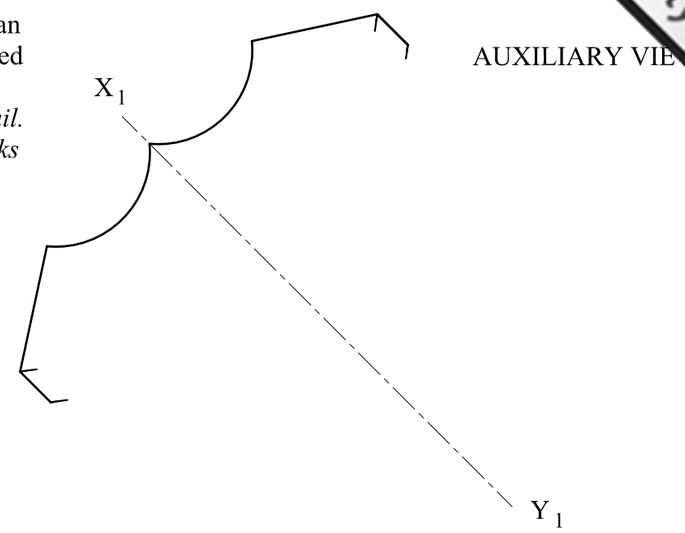
Two orthographic views of a Trophy Shield are given below.

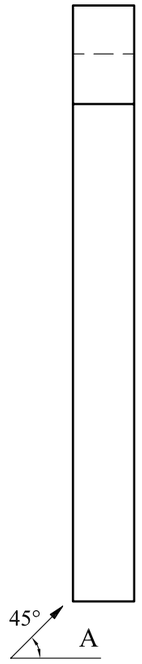
Using the given start lines, project an Auxiliary view of the shield as viewed from the direction of arrow 'A'.

Note: Do not show any hidden detail.

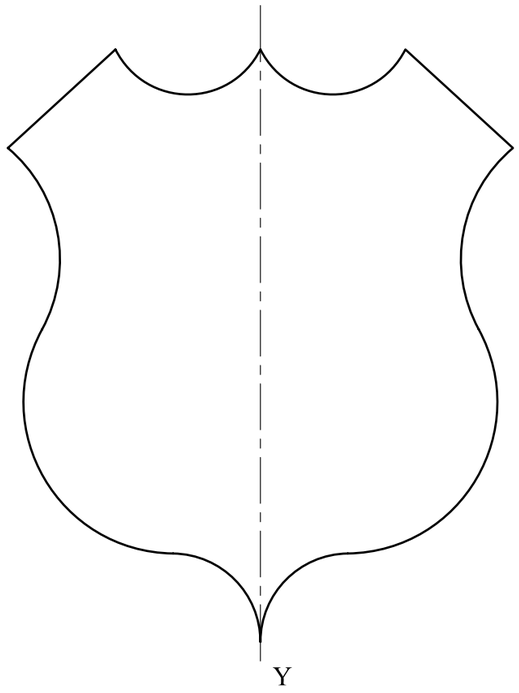
14 marks







END ELEVATION



FRONT ELEVATION

Sheet 2 of 4

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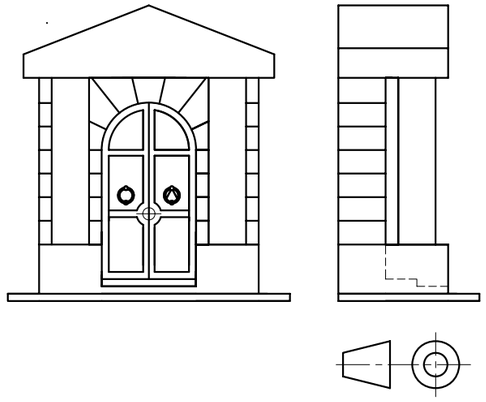
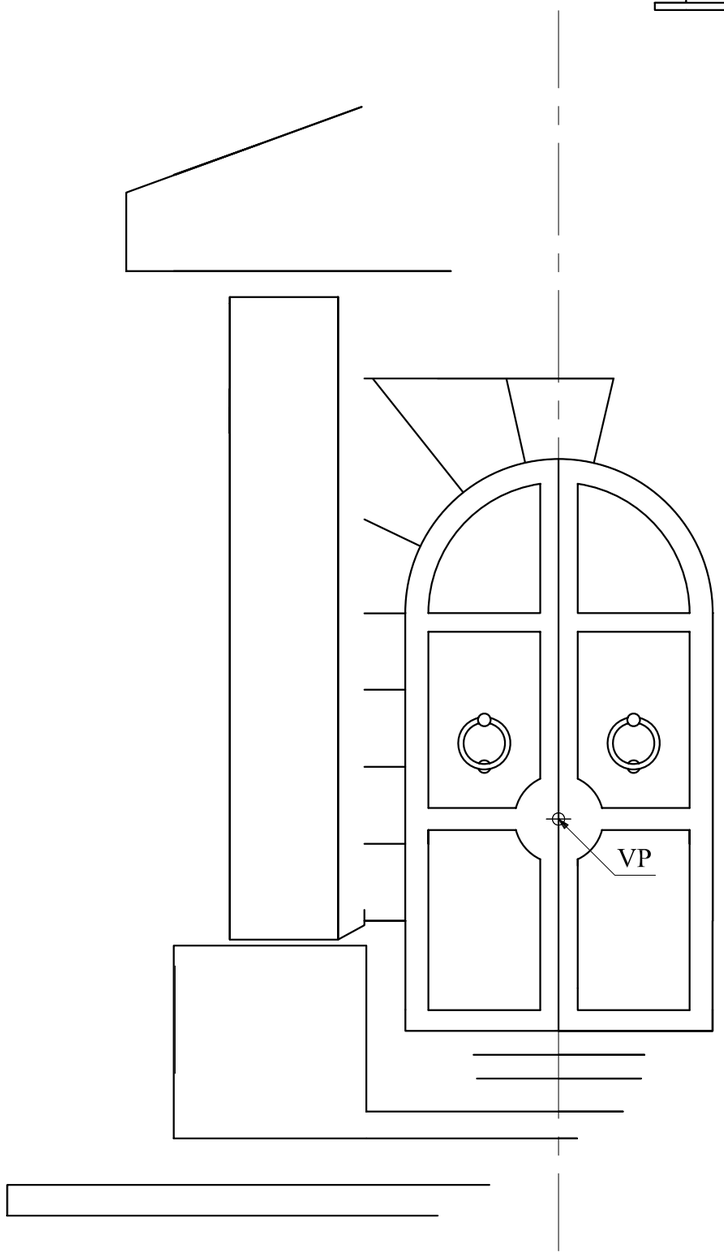
Question 5.
A front and an end view of a classic door porch are shown on the right. The start lines and the vanishing point of an estimated **single-point perspective** view are given below. You are requested to complete the perspective view leaving all construction lines converging to the vanishing point visible.

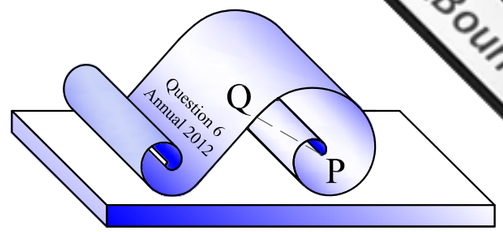
12 marks

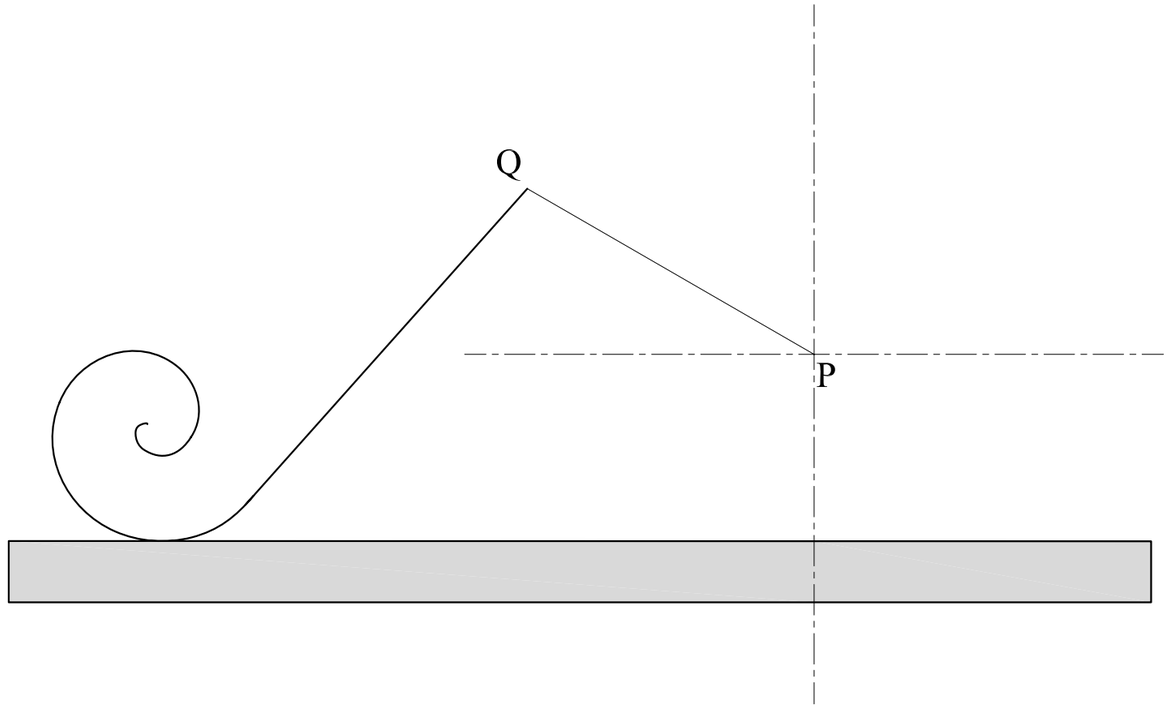




Question 6.
A pictorial view of a paper scroll is shown on the right.
The end view of the scroll is made up of two Archimedean spirals joined by a common tangent. The smaller spiral and the tangent are given in the start lines below.
You are required to construct **one and a half** revolutions of a clockwise Archimedean spiral from point Q to the pole P to complete the scroll.
Note: Line QP given below is 54mm long and may be divided by means of a ruler.

12 marks





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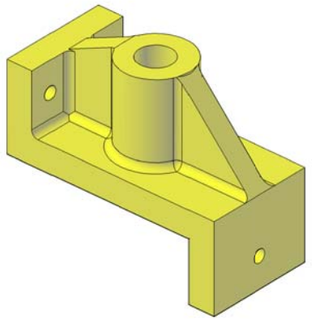
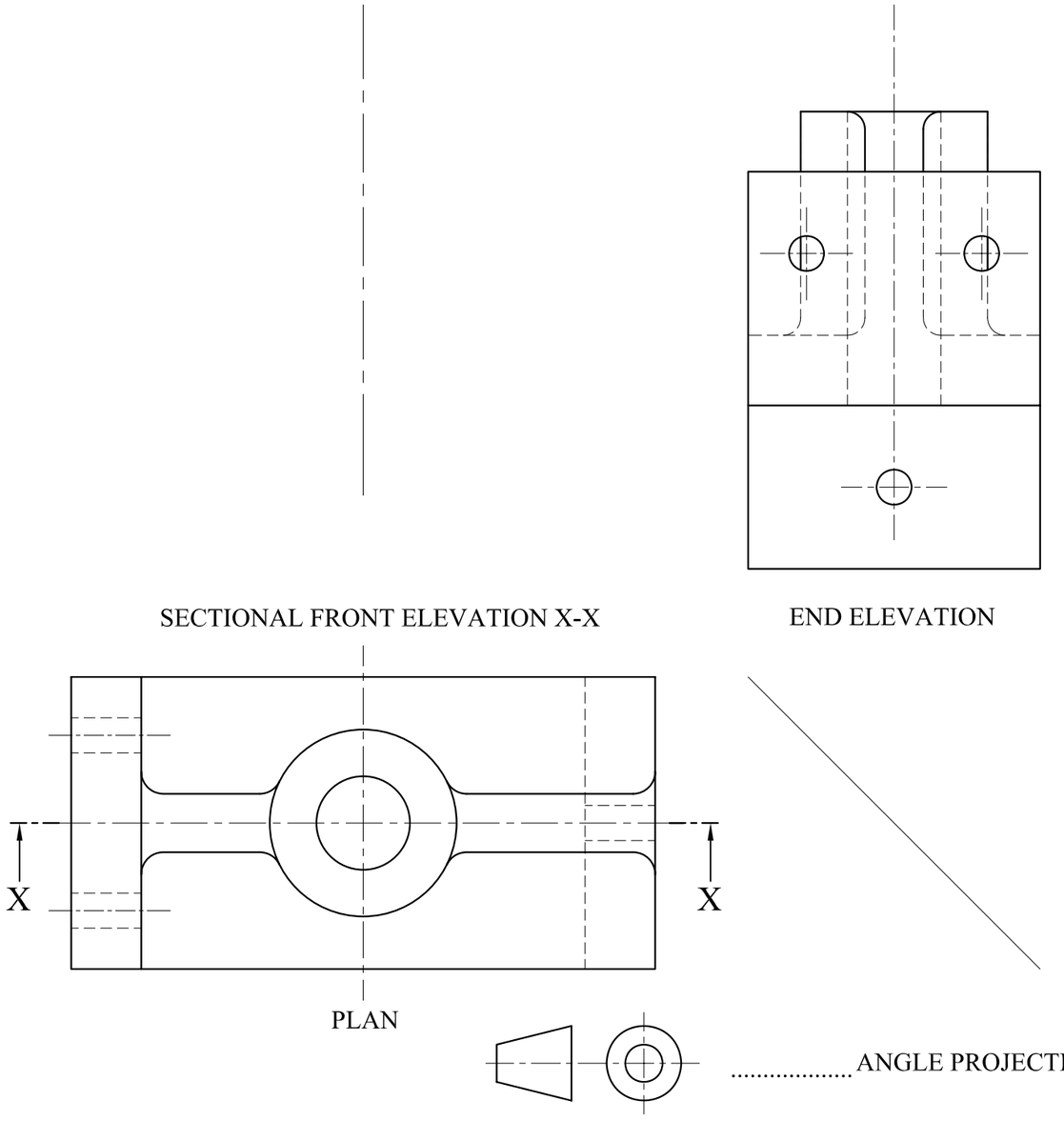
Question 7.

A pictorial view of a LOCATING BASE is shown.
An end elevation and a plan are given below.
In the space provided: a) project the Sectional Front X-X,
b) print the angle of the projection used.

Note: Do not show any hidden detail.

14 marks





SECTIONAL FRONT ELEVATION X-X

END ELEVATION

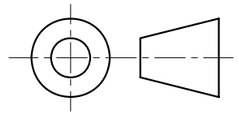
PLAN

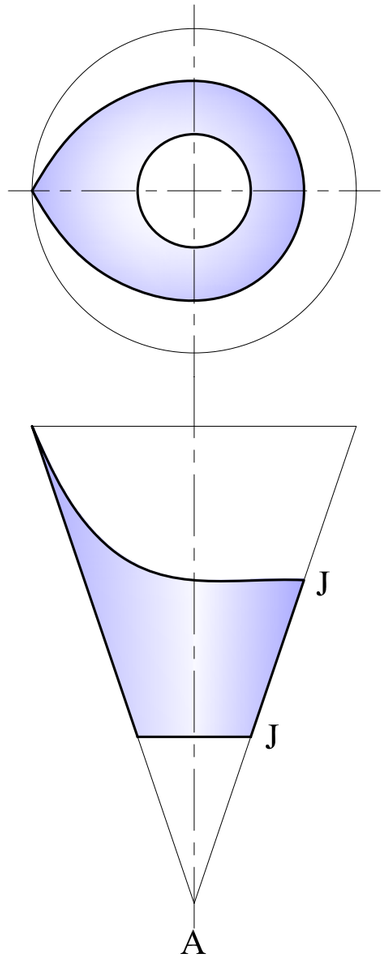
..... ANGLE PROJECTION

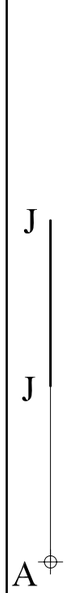
Question 8.

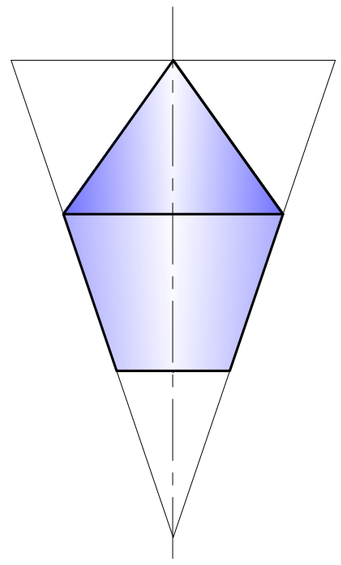
A pair of sheet metal articulated gauntlets (protective gloves) are shown on the right. Three orthographic views of the cut conical part of the gauntlets are given below.
In the space provided and using the given start lines, construct the surface development of the cut cone placing the joint line along J-J.

12 marks









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