Problem 9 *Draw the isometric view of a square prism, with side of base 40 and length of axis 70, when its axis is (i) vertical and (ii) horizontal.* (Aug/Sept 2008, JNTU)

Case I Axis vertical

Construction (Fig. 15.21b)

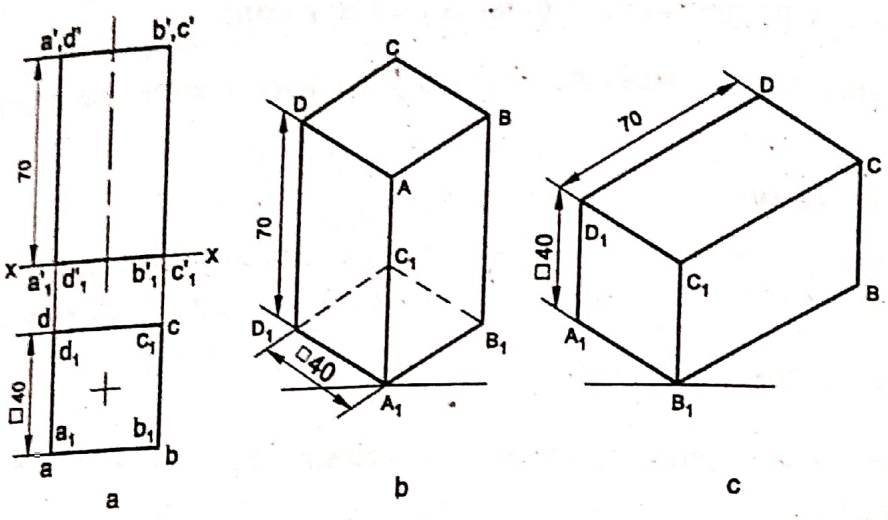


Fig. 15.21

1. Draw the isometric view A_1 B_1 C_1 D_1 of the bottom base of the prism, which is a square of 40 side.
2. Through the points A_1, B_1, C_1 and D_1, draw vertical lines A_1A, B_1B, C_1C and D_1D, of length equal to 70.
3. Join A, B; B, C; C, D and D, A.
4. Darken the visible edges and obtain the isometric view of the prism.

Figure 15.21c shows one of the two possible orientations of the prism, when its axis is horizontal.

Problem 10 *Draw the isometric view of a hexagonal prism, with side of base 25 and axis 60 long. The prism is resting on its base on H.P, with an edge of the base parallel to V. P. Use the box method.* (Aug/Sept 2008, JNTU)

Construction (Fig. 15.22)

1. Draw the projections of the prism, satisfying the given conditions.
2. Enclose the views in rectangles.
3. Draw the isometric view of the rectangular box.
4. Determine the distances (off-sets) of the corners of the bases, from the edges of the box.
5. Using the off-sets, locate the corners of the bases at the top and bottom bases of the prism, in the isometric view.
6. Join A, A_1; B, B_1, etc., and darken the visible edges and obtain the required isometric view.

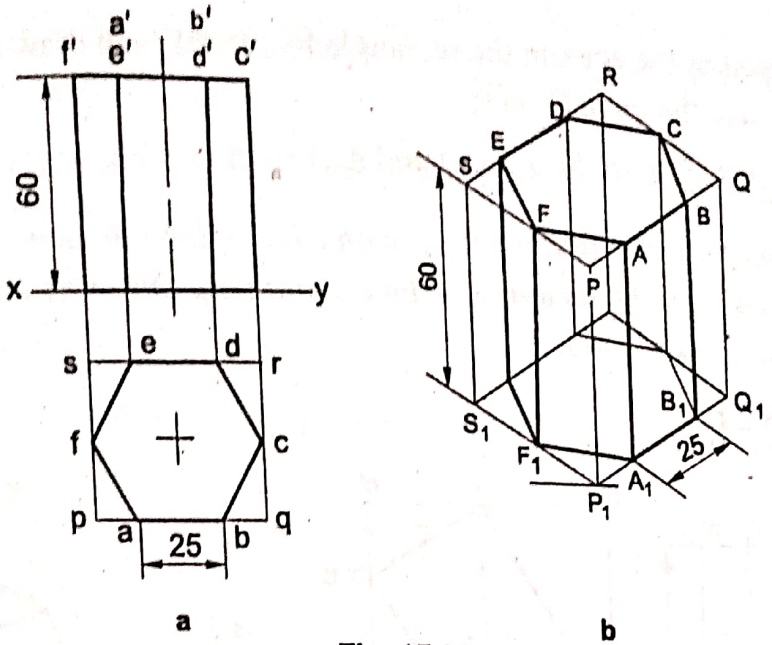


Fig. 15.22

Problem 11 *Draw the isometric view of a pentagonal pyramid, with side of base 25 and axis 60 long. The pyramid is resting on its base on H.P, with an edge of the base (away from the observer) parallel to V. P. Use the off-set method.*

Construction (Fig. 15.23)

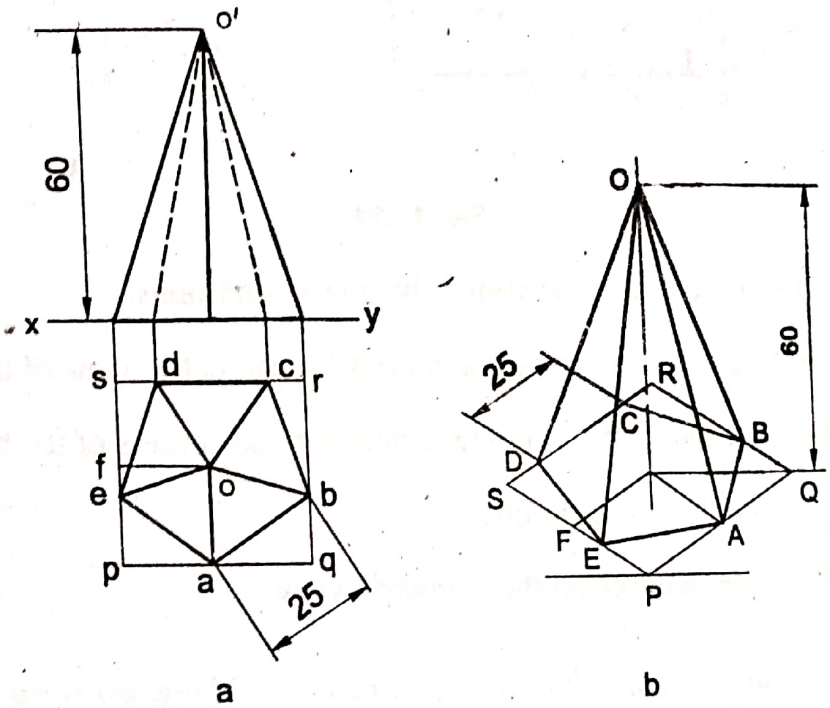


Fig. 15.23

1. Draw the projections of the pyramid, satisfying the conditions.
2. Enclose the top view (pentagon) in a rectangle pqrs.
3. Determine the off-sets of the corners of the base and apex of the solid.
4. Draw the isometric view of the rectangle pqrs and locate the corners of the base A,B,C,D,E along the edges of the rectangle.

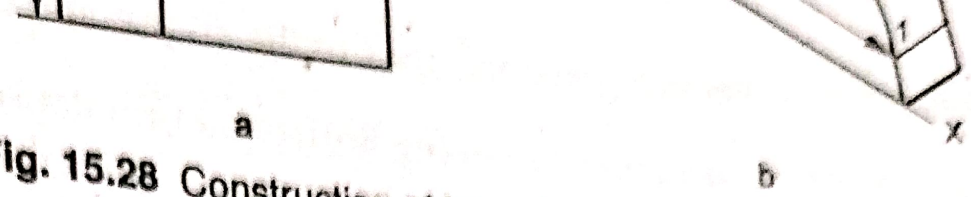


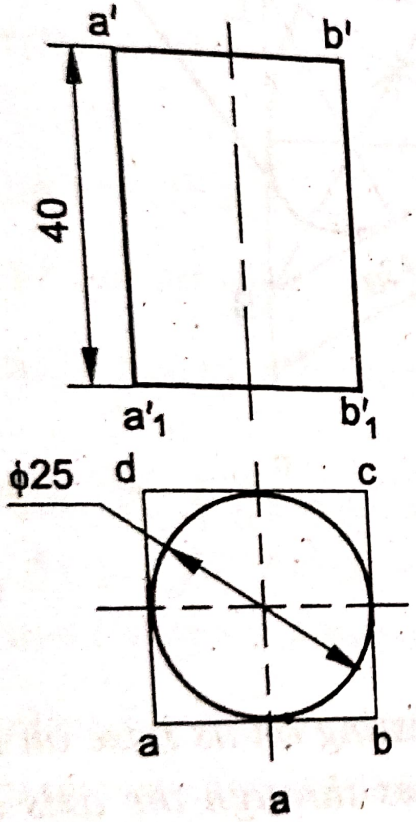
Fig. 15.28 Construction of irregular curve in isometric

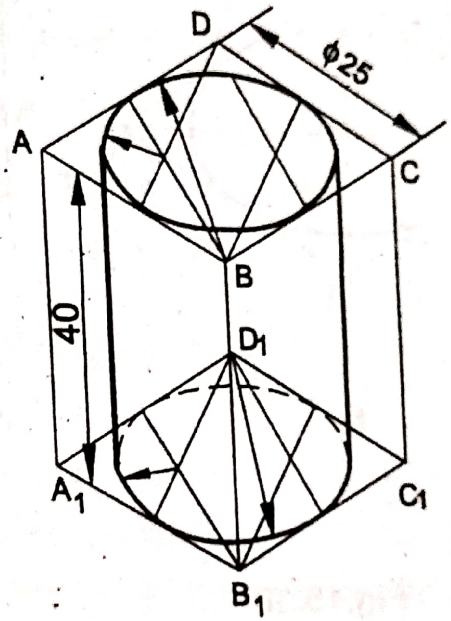
15.3.12 Isometric projections of cylinders and cones

Problem 17 *Make the isometric drawing of a cylinder of base diameter 25 and axis 40 long.*

(Aug/Sept 2008, JNTU)

***Construction* (Fig. 15.29b)**





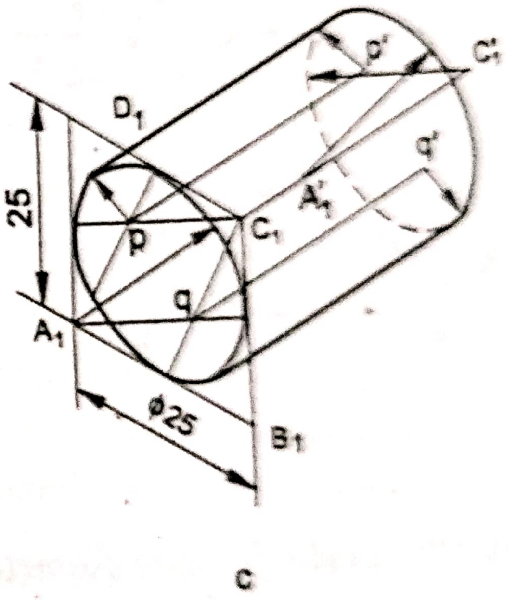


Fig. 15.29

1. Enclose the cylinder in a box and draw its isometric drawing.
2. Draw ellipses, corresponding to the bottom and top bases, by using the four-centre method.
3. Join the two bases by two common tangents.

NOTE Figure 15.29c shows the isometric drawing of a cylinder, using the off-set method and assuming horizontal orientation. Following are the stages of construction:

(i) Construct the isometric drawing, corresponding to the bottom base of the cylinder, by the four-centre method.

(ii) Project the four centres through a distance equal to the length of the axis and draw the ellipse, corresponding to the top base of the cylinder.

(iii) Join the two ellipses by two common tangents and complete the drawing.

Problem 18 *Draw the isometric drawing of a cone of base diameter 30 and axis 45 long. Use the off-set method.* (AUg/Sept 2008, JNTU)

Construction (Fig. 15.30)

1. Enclose the base of the cone in a square.
2. Draw the ellipse, corresponding to the circular base of the cone.
3. From the centre of the ellipse, draw a vertical centre line and locate the apex O at a height of 45.
4. Draw the two outer-most generators from the apex to the ellipse and complete the drawing.

Figure 15.30c shows the construction, assuming horizontal orientation.

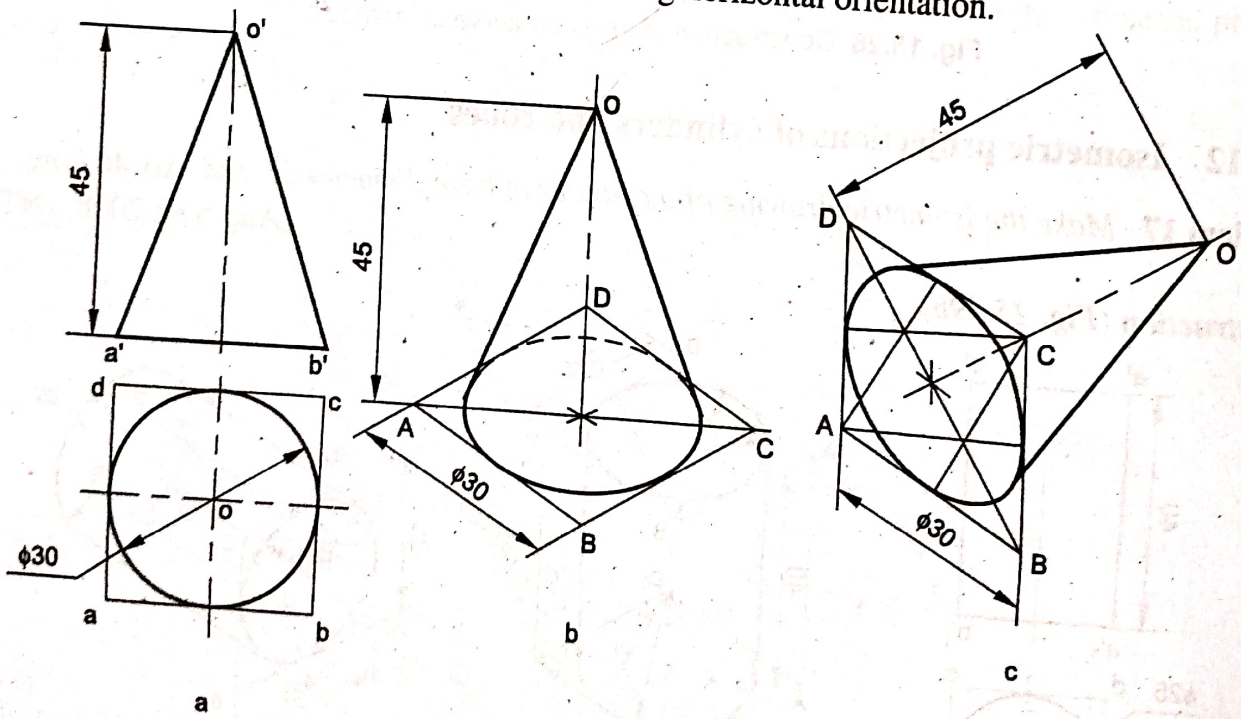


Fig.15.30

Problem 19 *A cylinder with diameter of base 60 and axis 70 long, is resting on its base on H.P. A section plane, perpendicular to V.P and inclined at 45° to H.P, passes through the axis at a distance of 20 from its top end. Draw the isometric projection of the truncated cylinder.*