INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY
Department of Mechanical Engineering

ME-119 Engineering Drawing & Graphics 2017-18 Semester II

Sheet 9: Intersection of Surfaces

Instructions:

- Practice all problems roughly before coming to the Drawing Session.
- For more details of the exercises in this sheet, refer Chapter 16 of the textbook (N. D. Bhatt, Engineering Drawing, 52nd Ed.).
- Scale, dimension the drawings suitably. Label the important nodes/points on the drawings. Mention the scale if it is not 1:1.
- You may use the MIRROR command to reflect points around lines of symmetry.
- Make the title block and name plate before starting the drawing.
- Use 1st angle projection unless mentioned otherwise.

Questions:

1. A square prism of base side 60mm, axis 100mm is resting on its base on H.P. with a face inclined at 30º to V.P. It is completely penetrated by another square prism of base side 45mm & axis 100mm and faces of which are equally inclined to V.P. The axes of both the prisms bisect each other at right angles. Draw 3 projections of solids and show lines of intersection.
2. A square pyramid of base side 70mm and axis 100mm is resting on its on the H.P. with the sides of the base equally inclined to the V.P. It is penetrated by a square prism of based side 30mm having its axis parallel to both the principal planes and 30mm above the H.P and 8mm in front of the pyramid axis. The base edges of the prism are equally inclined to the H.P. Draw the projections of the solids showing lines of intersection.
3. A triangular pyramid (64 mm base side and 80 mm height) is resting on the ground with one base edge parallel to VP (and closer to it). A cylinder of 36 mm diameter and 90 mm length passes through the pyramid. The axis of the cylinder is parallel to the axis of the pyramid, but10 mm away from it (closer to VP). Draw the 3 views and show the curve of intersection.
4. A sphere of diameter 80mm is penetrated by a square prism of base side 40mm and height 120mm. The faces of the prism are equally inclined to V.P. while the axis is perpendicular to H.P. and the midpoint of the axis coincides with the centre of the sphere. Draw the projections of the solids and show the curves of intersection.
5. A cone of base diameter 100mm and axis 110mm is resting on its base on the H.P. It is completely penetrated by a cylinder of base diameter 40mm whose axis (=120mm) is parallel to both the principal planes and the midpoint of its axis is 35mm above the H.P, and 10mm in front of axis of the cone. Draw the 3 views of the solids and show the curve of intersection.
6. Two cones equal in all respects (base diameter = 60 mm, height = 80 mm) intersect each other. One cone rests on its base in H.P. The other cone is upside down with its apex touching the base of the other in H.P. The axes are parallel and 15 mm apart. The plane containing the axes is parallel to the VP. Draw the three views of the cones showing the curve of intersection.