INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY
Department of Mechanical Engineering

ME119 – Engineering Drawing and Graphics 2017-18 Semester II

Sheet 4: Projection of Lines on Auxiliary Planes

Instruction:

- Practice all problems in rough before coming to the Drawing Session.
- For more details of the exercises in this sheet, refer Chapter 10 & 11 of the text book (N. D. Bhatt, Engineering Drawing, 50th 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

1. The front view of a line makes an angle of 30 deg w.r.t. xy reference line. The Horizontal Trace (H.T.) of the line is 45 mm in front of the V.P., while its Vertical Trace (V.T.) is 30 mm below the H.P. One end of the line is 10 mm above the H.P. and the other end is 100 mm in front of the V.P. Draw the projections of the line, determine its true length, and find the inclinations of the line with the H.P. and V.P. You do not necessarily need to use auxiliary planes for this problem.

2. A line AB is in the first quadrant. Its ends A and B are 15 mm and 45 mm above the H.P. respectively. The distance between the end projectors is 55 mm. The line is inclined at 35 deg to the V.P. and its V.T. is 8 mm below the x-y line. Draw the projections of the line. Find its true length, locate its H.T. You do not necessarily need to use auxiliary planes for this problem.

3. End A of a line AB is 40 mm below the H.P. and 15 mm behind the V.P. The end B is 25 mm above the H.P. and 15 mm in front of the V.P. The distance between the end projectors of AB is 90 mm. The point P is 25 mm below the H.P. and 35 mm behind the V.P. The projector through P seems to be passing through the intersection of the F.V. and T.V. of AB. Draw the projections of the line and find the shortest distance between point P and line AB using auxiliary planes.

4. A line AB is inclined to the H.P. and is parallel to the V.P. the end A is 10 mm above the H.P. and 25 mm in front of the V.P. The end B is 40 mm above the H.P. Another line CD is inclined to the V.P. and parallel to the H.P. The end C is 15 mm above the H.P. and 60 mm in front of the V.P. The end D is 10 mm in front of the V.P. Both the lines share common end projectors which are 50 mm apart. Draw the projections of the lines and find the shortest distance between them using auxiliary planes.

5. A room is 7m long, 5m wide and 4m high. A bulb hangs at the center of the room, 1.5 m below the ceiling. A thin straight wire connects the bulb to a nail, located at one of the

corner edges of the room. The nail is 1m above the floor. Draw the projections of the wire, assuming any of the side walls to be the V.P. Find the true length of the wire and true angle of the wire with respect to the floor, using auxiliary planes.

6. A line PQ, 80 mm long, is inclined to the H.P. at 25 deg, and is parallel to the V.P. Another line RS is inclined to the V.P. at 50 deg and is parallel to the H.P. The points P and R lie on the same projector and both are 20 mm above the H.P. The points Q and S lie on the same projector and both are 40 mm in front of the V.P. draw the projections of both the lines. Find the shortest distance between the two lines, and the true length of RS using auxiliary planes.