INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY
Department of Mechanical Engineering
ME119 – Engineering Drawing and Graphics

(2021-22) Semester II

Sheet 4: Projections of Solids

Instructions:

- For more details of the exercises in this sheet, refer Chapters 14 of the text book (N. D. Bhatt, Engineering Drawing, 53rd Ed.).
- Scale, dimension the drawings suitably. Label the important nodes/points on the drawings.
- Mention the scale if it is not 1:1.
- The geometrical construction lines should be light as compared to the main figure lines.
- Scale and dimension the drawings suitably. Label the important nodes/points on the drawings. Mention the scale next to the drawing if it is not 1:1 (Just write SCALE 1:2 etc. for reducing scale and SCALE 2:1 etc. for enlarging scale).
- Use 1st angle projection unless mentioned otherwise
- Use plain A4 sheets only. Make the borders and title block as per the template.
- Indicate hidden lines and center lines clearly
- Any submission done after the deadline will result in ZERO marks.

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1. A pentagonal pyramid of 30 mm side and 90 mm height is initially resting on its base on the HP such that its right base edge is perpendicular to the VP and the nearest corner is 10 mm in front of VP. It is now tilted on its edge perpendicular to VP so that the base makes an angle of 30^0 with the HP but remains parallel to the VP. Draw the front and top views of the initial and final configuration.

2. A square prism has base side 40 mm and length of axis 60 mm. It has its axis perpendicular to the HP and two of the rectangular faces are inclined at 60° to the VP. Draw the projections if the lower base is 10 mm above the HP, and the edge closest to the VP is at a distance of 30 mm. Draw the projections of the prism. Show all the steps involved.

3. A hexagonal prism of 30 mm side and 90 mm height is resting on one of its lateral surfaces on HP such that its axis is parallel to both VP and HP and 50 mm in front of VP. It is then rotated such that its axis makes an angle of 25^0 with respect to the VP with the right hexagonal face turned towards VP and the axis passing through this face is at 30 mm in front of VP. However, the axis

remains parallel to HP. Draw the front and top views of the initial and final configuration.

4. A triangular prism has base side 40 mm and length of axis 60 mm. It has its axis perpendicular to the VP and one of the rectangular faces is inclined at 45° to the HP. One of the bases is 20 mm in front of the VP, and one of the edges is 20 mm above the HP. Draw the projections of the prism. Show all the steps involved.

5. A frustum of base diameter 50 mm and top diameter 35 mm and height 70 mm is resting on its base with its axis 60 mm in front of VP. It is tilted such that its base makes an angle of 30^0 with HP but its axis remains parallel to VP. Draw the front and top views of the initial and final configuration.

6. A square prism of base side 25 mm and axis 50 mm long has one of its faces in the vertical plane and the axis inclined to 60° the HP. Draw the projections by using (i) the usual method of rotating the object step by step, and (ii) by using the auxiliary plane method.

7. A triangular prism has base side 25 mm and axis 50 mm long. It has an edge of the base in the VP and its axis makes 60° with the VP. An edge adjacent to the edge in the VP makes an angle 45° with the HP. Draw the projections of the prism. All the steps involved must be drawn.

8. A pentagonal pyramid of 30 mm side and 70 mm height is resting on one of its edges that is perpendicular to the VP and the axis is parallel to both VP and HP, and the apex pointing towards the right profile plane and 20 mm from it; nearest corner of the base is 10 mm from VP. It is then rotated such that its axis makes an angle of 45^0 with respect to the VP and the apex points away from the VP, but the axis remains parallel to HP and the nearest corner to the VP remains at 10 mm. Draw the front and top views of the initial and final configuration.