Unit I

1. Sketch by free hand the front view, the top view, and the right-side view of the object shown in fig. Assume proportional dimensional in mm.
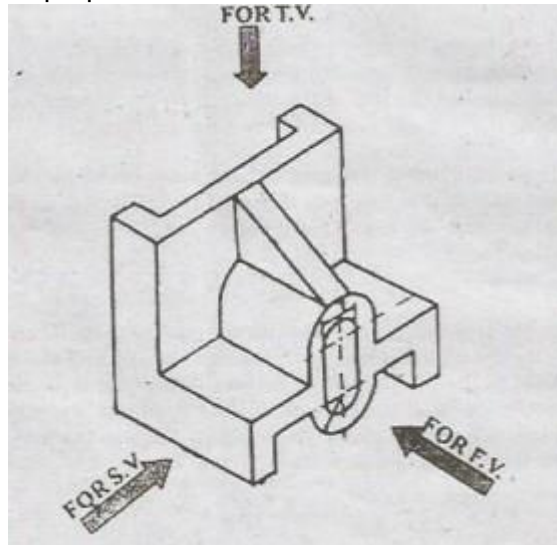
2. A circle of diameter 50 mm rolls along the inside of another circle of diameter 200 mm without slipping. Draw the path traced by a point on the smaller circle. Draw a tangent and a normal at a point on the curve.

Unit II

1. A straight line ST has its end S, 10 mm in front of the VP and nearer to it. The mid-point m of the line is 50 mm in front of the VP and 40 mm above the HP. The front and top views measure 100 mm and 120 mm respectively. Draw the projections of the line. Also find its true length and true inclinations with the reference planes.
2. A hexagonal plate of side 20 mm rests on the HP on one of its sides inclined at 45^0 to the VP. The surface of the plate makes an angle of 30^0 with the HP. Draw the front and top views of the plate.

Unit III

1. A hexagonal pyramid with 30 mm base side and 70 mm long axis is lying on a slant edge on the ground such that the axis is parallel to the VP. Draw its projections.
2. A pentagonal pyramid of base edge 25 mm and axis length 60 mm rest on one base side on HP such that the highest base corner is 20 mm above HP. Its axis is parallel to the VP. Draw its top and front views.

Unit IV

1. A right circular cone of base diameter 50 mm and axis length 60 mm rests on its base on the HP. It is cut by a plane perpendicular to the HP and inclined at 60^0 to the VP. The shortest distance between the cutting plane and the top view of the axis is 8 mm. Draw the top view, sectional front view and the true shape of the section.

2. A square prism of base edge 50 mm sides and axis 70 mm long a standing on its base with its faces equally inclined to the VP. It is cut by a section plane inclined at 45^0 to HP and passing through the intersection of the top surface and the face of the solid. Draw the development of the lateral surfaces of the lower portion of the truncated solid.

Unit V

1. Draw the isometric view of a frustum of a hexagonal pyramid when it is resting on its base on the HP with two sides of the base parallel to the VP. The side of base is 20 mm and top 8 mm. The height of the frustum is 55 mm.

2. A rectangular prism 40 × 30 × 15 mm rest on the ground on one of its ends with one of the longest edges touching the PP and the shortest edges receding to the left at the left at an angle of 40^0 to the PP. The nearest vertical edge is 15 mm to the left of the station point which is at a distance of 55 mm in front of the PP and 30 mm above the ground. Draw the perspective view of the prism.