

Shri Ramdeobaba College of Engineering & Management, Nagpur.

Department of Mechanical Engineering

Engineering Drawing Practical Problem Sheet

Sheet No.:- 1.

Scales and Curves

(Manual)

1. The distance between two places is 350 km and corresponding distance shown on map measures 7 cm. Draw a diagonal scale showing single km. The scale should be long enough to read up to 700 km. What is its RF also indicate on this scale 480 km, 300 km and 8 km.
2. The area of a field is 50,000 sq. m the length and breadth of the field, on the map is 10 cm and 8 cm respectively. Construct a vernier scale, which can read upto one meter. Mark the lengths of 235 meter and 62 meter on the scale. What is RF of the scale?
3. Two fixed points A and B are 100 mm apart. Trace the complete path of a point P is moving (in the same plane as that of A and B) in such a way that the sum of its distance from A and B is always the same and equal to 125 mm. Name the curve.
4. A major axis of an ellipse is 80mm. Foci are 50mm apart. Draw upper part of an ellipse by using “concentric circle method and lower half by “Rectangle method”
5. Two straight lines OA and OB make an angle of  $75^{\circ}$  between them. P is a point 40 mm from OA and 50 mm from OB. Draw a hyperbola through P, with OA and OB as asymptotes.



1. A line AB 90 mm long is inclined at  $45^\circ$  with HP and its Top view makes an angle of  $60^\circ$  with VP. The end A is in HP, & 12 mm in front of VP. Draw the projections and find its inclination with VP.
2. The Front view of a 90 mm long line PQ measures 60 mm and its Top view measures 70 mm. Its end Q and the mid-point M are in first quadrant, M being 40mm from both the planes. Draw the projections of line PQ.
3. A line CD, inclined at  $25^\circ$  to the HP measure 80 mm in TV. The end C is in the first quadrant and 24 mm and 14 mm from HP and VP respectively. The end D is at equal distances from both the RP. Draw the projections find True length and True inclination with VP. Locate its Traces.
4. A and B are the ends of a straight line AB. The end A is 65mm above HP and 40mm in front of VP. The end B is 15mm above HP and 75mm in front of the VP. The distance between the projectors along XY line is 65mm. Draw the projections of the line AB and determine its inclination with HP and VP.

1. An object O is placed 1.2 m above the ground and in the centre of room 4.2 mX3.6 m X 3.6 m high. Determine graphically the distance from one of the corners between the roof and two adjacent walls. Scale 1cm=0.5m
2. A wireless axial tower 20m high is tied by two guy ropes, having angles of depression  $30^\circ$  and  $40^\circ$ . Other ends of the ropes are tied at two towers of height 5m and 7.5m respectively and 15m apart. Draw projections of guy ropes and find their true lengths.
3. Three vertical poles AB, CD & EF are respectively 5, 8 & 12 meters long. Their ends B, D & F are on the ground and lie at the corners of an equilateral triangle of 10 m long sides. Determine graphically the distance between the top ends of the poles, i.e. AC, CE, & EA.

1. Draw the projections of a circle of 75 mm diameter having the end A of the diameter AE in the HP, the end E in the VP, and the surface inclined at  $30^{\circ}$  to the HP and at  $60^{\circ}$  to the VP.
2. A regular pentagon of 30 mm sides is resting on HP on one of its sides with its surface  $45^{\circ}$  inclined to HP. Draw its projections when the side in HP makes  $30^{\circ}$  with VP.
3. A rhombus of diagonals 40 mm and 70 mm long respectively having one end of its longer diagonal in HP while that diagonal is  $45^{\circ}$  inclined to HP and makes  $30^{\circ}$  inclinations with VP. Draw its projections.
4. A semicircular plate of 80 mm diameter has its straight edge in the VP, and inclined at  $45^{\circ}$  to the HP. The surface of the plate makes an angle of  $30^{\circ}$  with the VP. Draw its projections.

1. A cylinder of base 60 mm diameter and height 80 mm has the midpoint of the axis 60 mm away from both the RP. The axis is inclined at  $30^{\circ}$  to the VP and  $60^{\circ}$  to the HP. Draw the projections.
2. Draw the projections of cone, base 50 mm diameter and axis 75 mm long, lying on a generator on the ground with the top view of the axis making an angle of  $45^{\circ}$  with the VP.
3. Draw the three views of a cube of side 60 mm when solid diagonal is parallel to H.P. and perpendicular to V.P.
4. A pentagonal pyramid, side of base 30mm and height 70mm rests on one of the corners of its base on HP the base being tilted up until the vertex is 60mm above HP. Draw three views of the pyramid with the edge of the base opposite to the corner on which it is resting made inclined at  $60^{\circ}$  to VP.

1. A cone, base 65 mm diameter and axis 75 mm long, is lying on the ground on one of its generators with the axis parallel to the VP. A section plane which is parallel to VP cuts the cone 6 mm away from the axis. Draw the sectional front view and development of the surfaces of the remaining portion of the cone.
2. A cube of 40mm side rests on a corner on the HP with the body diagonal through that corner perpendicular to the HP. It is cut by
  - A) An AVP passing through the vertical body diagonal and inclined at  $45^{\circ}$  to the VP
  - B) A horizontal section plane passing through the midpoint of the vertical body diagonalDraw the sectional views in each case.
3. A pentagonal pyramid, base 30mm side and axis 60 mm long is lying on one of its triangular faces on the HP with the axis parallel to the VP. A vertical section plane, whose HT bisects the top view of the axis and makes an angle of  $30^{\circ}$  with the reference line, cuts the pyramid removing its top part. Draw the top view, sectional front view and true shape of the section and development of the surface of the remaining portion of the pyramid.

Draw Isometric Projection for Figure 1 & Isometric View for Figure 2, Figure 3

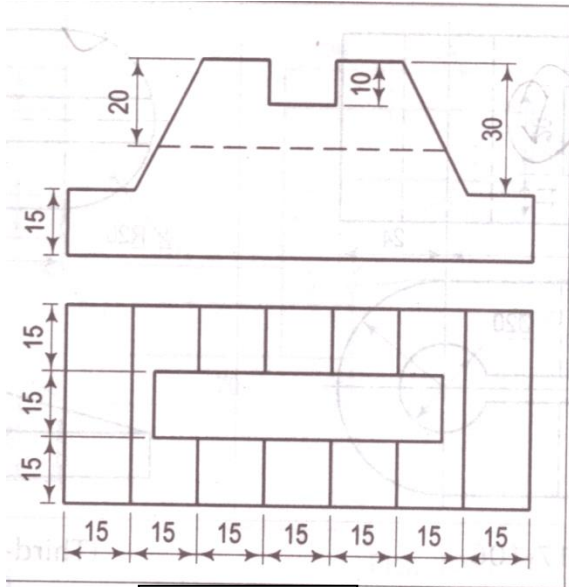


Figure No. 1

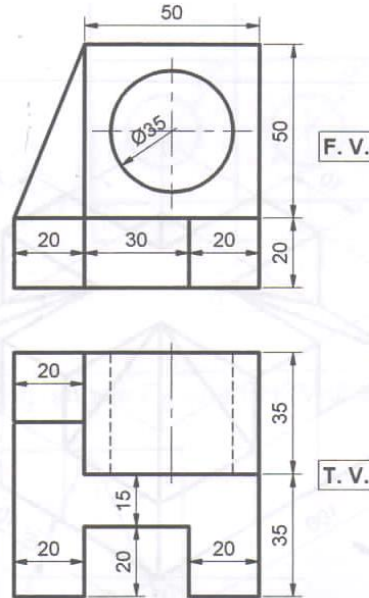


Figure No. 3

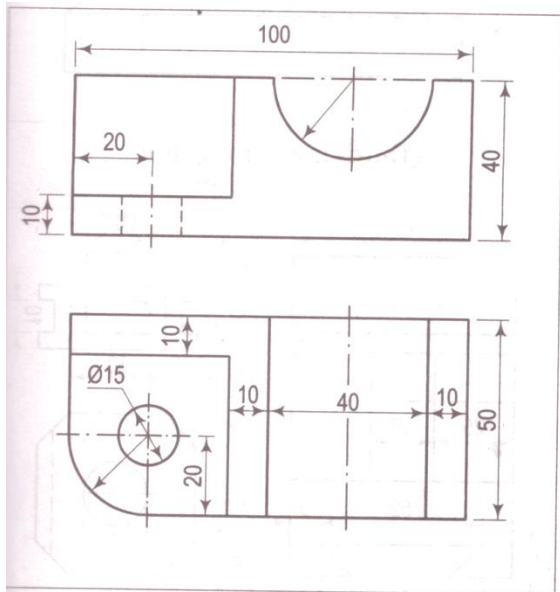


Figure No. 2

