UNIT – I

1. Construct a scale of 1:40 to read meters, decimeters and centimeters and long enough to measure upto 6M. Mark a distance of 4.76m on it.
2. If 1 cm long line on a map represents a real length of 4 m. Calculate the R.F. and draw a diagonal scale long enough to measure up to 50 metres. Show a distance of 44.5 m on it.
3. Construct a diagonal scale showing yards, feet and inches in which 2 inches long line represents 1.25 yards and is long enough to measure up to 5 yards. Find R.F. and mark a distance of 4 yards 2 feet 8 inches.
4. Draw an ellipse when the distance of its focus from its directrix is 65 mm and eccentricity is 2/3. Also, draw a tangent and a normal to the ellipse at a point 80 mm away from the directrix.
5. Draw Parabola of base 120mm and axis 80mm by oblong method.
6. Inscribe the largest possible ellipse in a rectangle of sides 170 mm and 130 mm.
7. Draw a parabola when the distance between its focus and directrix is 60 mm. Also, draw a tangent and a normal at a point 70 mm from the directrix.
8. Draw a hyperbola when the distance of its focus from its directrix is 60 mm and eccentricity is 3/2. Also, draw a tangent and a normal to the hyperbola at any point.
9. A point P of the hyperbola is situated at a distance of 40 mm and 50 mm from the pair of asymptotes. The asymptotes are perpendicular to each other. Draw a hyperbola using orthogonal asymptotes method.
10. Draw a cycloid of a circle of diameter 50 mm for one revolution. Also, draw a tangent and a normal to the curve at a point 35 mm above the base line.
11. Draw an epicycloid of a circle of diameter 50 mm, which rolls outside a circle of diam eter 150 mm for one revolution. Also, draw a tangent and a normal to the epicycloid at any point on epicycloid.
12. Draw a hypocycloid of a circle of diameter 50 mm, which rolls inside a circle of diameter 180 mm for one revolution. Also, draw a tangent and a normal to the hypocycloid at a point 50 mm from the centre of the directing circle.

UNIT – II

13. (a) Draw the projections of the following points on a common reference line keeping the distance between their projectors 30 mm apart.

(i) Point A is 20 mm below the H.P. and 50 mm in front of the V.P.

(ii) Point B is in the H.P. and 40 mm behind the V.P.

(iii) Point C is 30 mm in front of the V.P. and in the H.P.

(iv) Point D is lying on both H.P. and V.P.

(b) A 80 mm long line PQ has end P 20 mm above H.P. and 40 mm in front of the V.P. The line is inclined at 30° to the H.P. and is parallel to the V.P. Draw the projections of the line.

14.(a)Draw the projections of the following points on a common reference line keeping the distance between their projectors 30 mm apart.

(i) Point A is 50 mm above the H.P. and 30 mm in front of the V.P.

(ii) Point B is 20mm below the H.P. and 50 mm behind the V.P.

(iii) Point C is 10 mm in front of the V.P. and in the H.P.

(iv) Point D is lying on both H.P. and V.P.

(b) A 60 mm long line PQ lying on the H.P. is inclined at 30° to the V.P. Its end P is 20 mm in front of the V.P. Draw the projections of the line.

15.(a) Draw the projections of the following points on a common reference line keeping the distance between their projectors 30 mm apart.

(a) Point A is 30 mm above the H.P. and 50 mm in front of the V.P.

(b) Point B is in the H.P. and 40 mm in front of the V.P.

(c) Point C is 50 mm below the H.P. and in the V.P.

(d) Point D is 20 mm above the H.P. and 50 mm behind the V.P.

(b) An 80 mm long line PQ is inclined at 30° to the V.P. and is parallel to the H.P. The end P of the line is 20 mm above the H.P. and 40 mm in front of the V.P. Draw the projections of the line.

16.(a)A 60 mm long line AB is parallel to and 20 mm in front of the V.P. The ends A and B of the line are 10 mm and 50 mm above the H.P., respectively. Draw the projections of the line and determine its inclination with the H.P.

(b) A hexagonal plane of side 30 mm has a corner in the V.P. The surface of the plane is inclined at 45° to the V.P. and perpendicular to the H.P. Draw its projections. Assume that the diagonal through the corner in the V.P. is parallel to the H.P.

17.(a) An 80 mm long line MN has its end M 15 mm in front of the V.P. The distance between the ends projector is 50 mm. The front view is parallel to

and 20 mm above reference line. Draw the projections of the line and determine its inclination with the V.P.

     (b) A circular plane of diameter 50 mm is resting on a point of the circumference on the H.P. The plane is inclined at 30° to the H.P. and its centre is 35 mm in front of the V.P. Draw its projections

18. A straight line PQ has its end P 20 mm above the H.P. and 30 mm in front of the V.P. and the end Q is 80 mm above the H.P. and 70 mm in front of the V.P. If the end projectors are 60 mm apart, draw the projections of the line. Determine its true length and true inclinations with the refer ence planes.

19. A 70 mm long line PQ has its end P 20 mm above the H.P. and 40 mm in front of the V.P. The other end Q is 60 mm above the H.P. and 10 mm in front of the V.P. Draw the projections of PQ and determine its inclinations with the reference planes.

20. A hexagonal plane of side 35 mm has an edge on the H.P. Its surface is inclined at 45° to the H.P. and the edge on which the plane rests is inclined at 30° to the V.P. Draw its projections.

21. The diagonals of a rhombus measure 100 mm and 40 mm. The longer diagonal is inclined at 30° to H.P. with an end in H.P. and the smaller diagonal is parallel to both the principal planes. Draw its projections.

22. A thin circular plate of diameter 60 mm appears in the front view as an ellipse of major and minor axes 60 mm and 40 mm respectively. Draw its projections when one of the diameters is parallel to both the reference planes.

23. A hexagonal plane of side 30 mm has an edge in the V.P. The surface of the plane is inclined at 45 to the V.P. and the edge on which it rests is inclined at 30° to the H.P. Draw its Projection.

24. A hexagonal plane of side 30 mm has a corner on the ground. Its surface is inclined at 45° to the H.P. and the top view of the diagonal through the corner which is in the H.P. makes an angle of 60° with the V.P. Draw its projections.

UNIT – III

25. A pentagonal prism of base edge 30 mm and axis 60 mm rests on an edge of its base in the H.P. Its axis is parallel to V.P. and inclined at 45° to the H.P. Draw its projections.

26. A pentagonal prism of base side 30 mm and axis 70 mm has a corners on the H.P. and the axis is inclined at 45° to the H.P. Draw its projection when the plane containing the resting corner and the axis is parallel to the V.P

27. A hexagonal pyramid of base side 30 mm and axis 60 mm has an edge of its base on the ground. Its axis is inclined at 30° to the ground and paral lel to the V.P. Draw its projections.

28. A hexagonal pyramid of base edge 30 mm and axis 60 mm, has a triangular face on the ground and the axis parallel to the V.P. Draw its projections.

29. A hexagonal pyramid of base edge 30 mm and axis 60 mm, is lying on a slant edge on the ground with the axis parallel to the V.P. Draw its projections when the face containing the rest ing edge are equally inclined to the H.P.

30. A cylinder of base diameter 50 mm and axis 70 mm has a generator in the V.P. and inclined at 45° to the H.P. Draw its projections.

31. A hexagonal prism of base edge 30 mm and axis 70 mm has an edge of its base in the V.P. such that the axis is inclined at 30° to the V.P. and parallel to the H.P. Draw its projections.

32. A cone of base diameter 50 mm and axis 60 mm has a generator in the V.P. and the axis parallel to the H.P. Draw its projections.

33. A pentagonal prism of base side 30 mm and axis 60 mm has one of its rectangular faces on the H.P. and the axis inclined at 60° to the V.P. Draw its projections.

34. A pentagonal pyramid of base side 30 mm and axis 55 mm has a triangular face in the V.P. and the base edge contained by that triangular face is perpendicular to the H.P. Draw its projections.

35. A hexagonal pyramid of base edge 30 mm and axis 60 mm, has a triangular face on the ground and the axis parallel to the V.P.