2.5.3 Construction of an Archemedian Spiral

The plane curve traced by a point which moving uniformly away and uniformly around a fixed point is called an Archemedian Spiral. The linear distance travelled by the point during one revolution is called pitch or lead.

The Archemedian Spiral is used in the construction of cams, threads, scroll shocks, etc.

The construction procedure for an Archemedian spiral is explained below.

- Draw a circle with O as center and radius equal to the given pitch. Divide the circle with any number of equal parts, say 12. Name the dividing points as 1, 2, 3, ..., 12.(Figure 2.60(a))
- Divide radius O-12 into the same number of parts as that of the circle and again name the dividing points on the radius as 1, 2, 3, ..., 12. (Figure 2.60(b))
- With O as center and O1, O2, O3 as radii, draw arcs which intersect the radial line O1 at point a, O2 at point b, O3 at point c, and so on. (Figure 2.60(c))
- Draw smooth curve passing through the points O, a, b, c, ... and 12 to get the required spiral. (Figure 2.60(d))
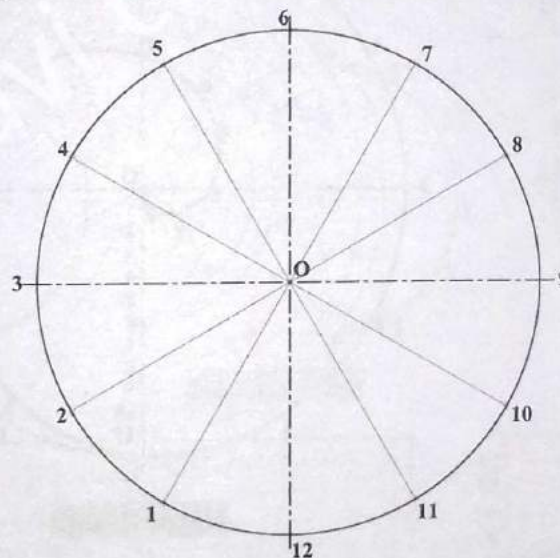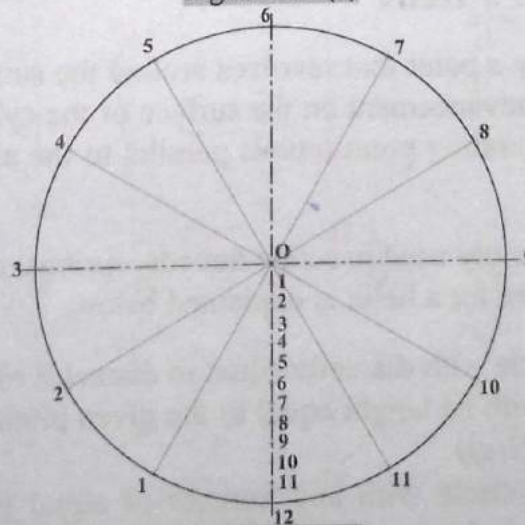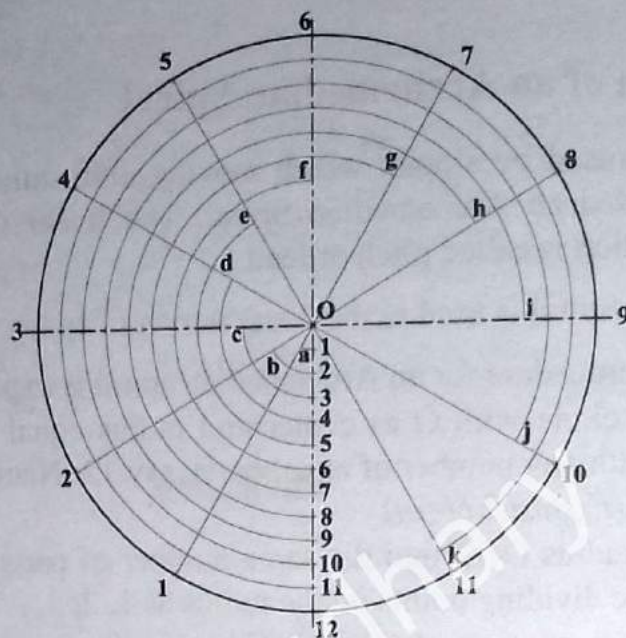

Figure 2.60(a)
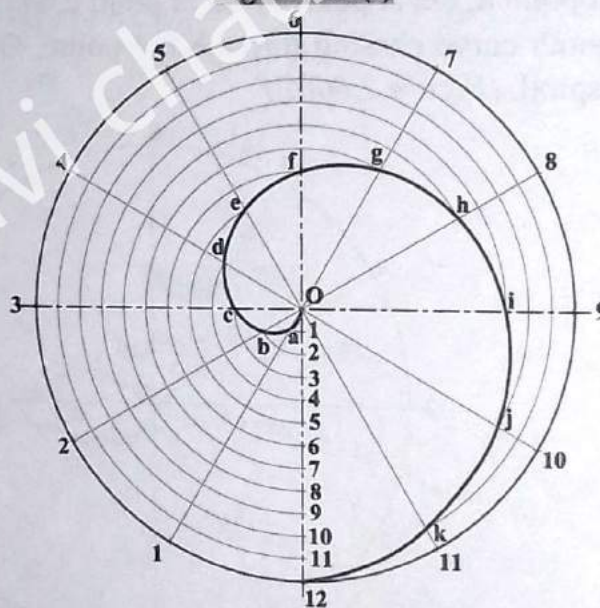

Figure 2.60(b)

Figure 2.60(c)

Figure 2.60(d)

2.5.4 Construction of a Helix

The space curve traced by a point that revolves around the surface of a right circular cylinder in such a way that its axial advancement on the surface of the cylinder is uniform is called a helix. The distance that the generating point travels parallel to the axis in one revolution is called the pitch or lead of the helix.

Helical profiles are commonly used in screw threads, springs, spiral staircase, conveyers, etc. The construction procedure for a helix is explained below.

- Draw a circle with diameter equal to diameter of the cylinder as its top view and a rectangle with its height equal to the given pitch as the front view of the cylinder. (Figure 2.61(a))
- Divide the circle with any number of equal parts, say 12. Name the dividing points as 1, 2, 3, ..., 12. (Figure 2.61(b))