

## 8.6 TYPES OF PROJECTIONS

Different types of perspective and parallel projections are shown in figure 8.14

• ACWING

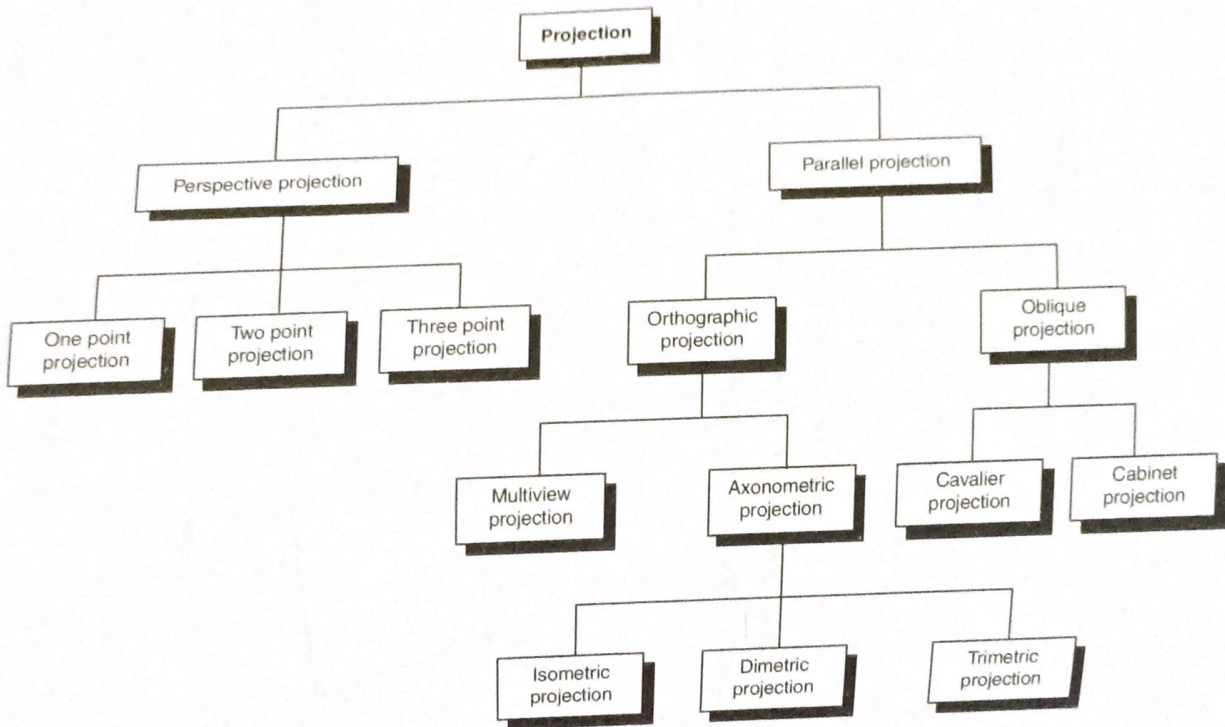


Fig. 8.14 Types of Projections

## 8.7 PERSPECTIVE PROJECTION

### 8.7.1 Introduction

- In perspective projection, the centre of projection (COP) is at a finite distance from the projection plane.
- When a 3D object is projected onto a view plane using perspective transformation equations, any set of parallel lines in the object that are not parallel to the projection plane, converge at a point. This point at which a set of projected parallel lines appears to converge is called *vanishing point*.
- A perspective projection produces realistic views but does not preserve the relative proportions of an object dimensions.
- Projections of distant objects are smaller than the projections of objects of same size that are closer to the projection plane.
- Mathematically, perspective projection can be described by specifying (see figure 8.15):

1. **Centre of Projection (COP).** It is a point where lines or projection that are not parallel to projection plane appear to meet.

2. **View Plane or Projection Plane.** The view plane is determined by :

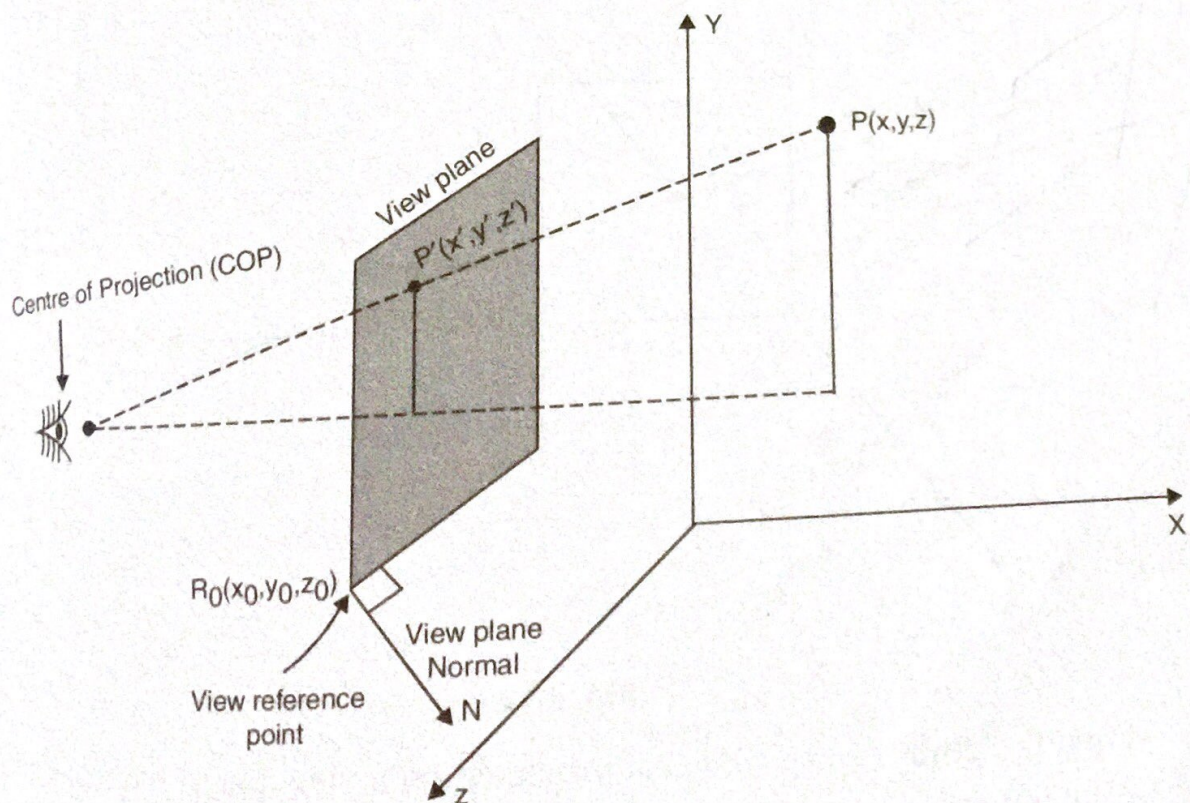


Fig. 8.15 Perspective Projection



- (i) View reference point  $R_0(x_0, y_0, z_0)$
- (ii) View plane normal  $N$  *i.e.*  $\vec{N} = n_1\hat{i} + n_2\hat{j} + n_3\hat{k}$

**3. Location of an Object.** It is specified by a point  $P$  that is located in world coordinates at  $(x, y, z)$  location. The objective of perspective projection is to determine the image point  $P'$  whose coordinates are  $(x', y', z')$