Unit 1
Projection of Lines

Prerequisite/Recapitulations

- Drawing, Sketching
- First angle & third angle projection
- Basics of engineering graphics

Learning objectives

To acquire knowledge about:

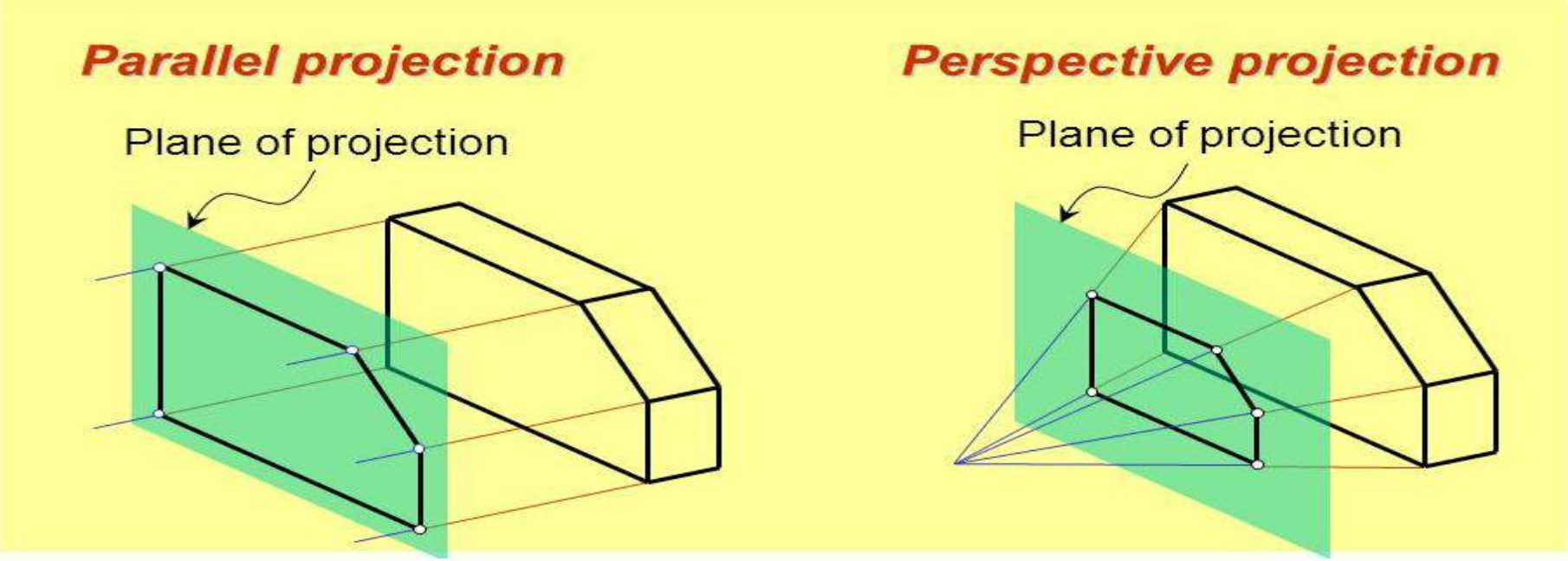
- Types of projection
  - Perspective
  - Oblique
  - Auxiliary
  - Orthographic
  - Isometric
- Orthographic System of Projection
- Principal Planes
- Convention for Projection
- Different cases of Projection of lines

Types of Projections

1. Perspective
2. Oblique
3. Auxiliary
4. Orthographic
5. Isometric

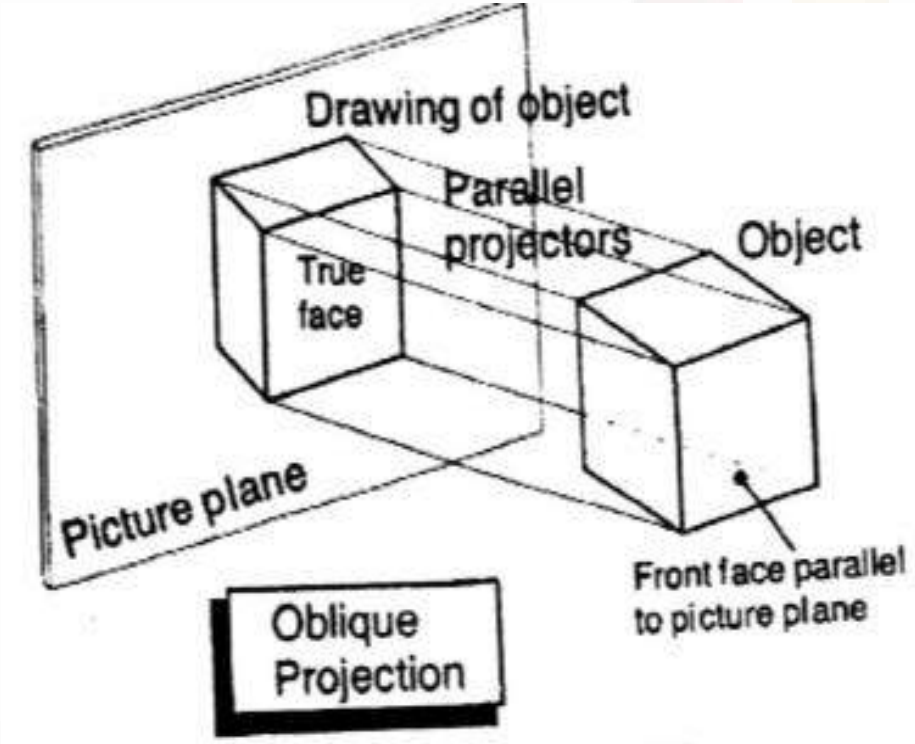
Perspective Projection

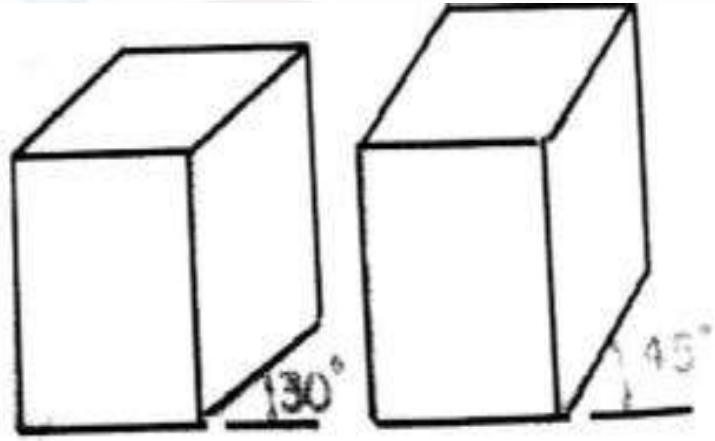
- Objects are drawn as it appears to human eye.
- Generally used for large objects such as building etc.
- The projection is obtained on a plane known as Picture Plane and the view is taken from a point known as Station Point



Oblique Projection

- In this the projectors are neither parallel nor at right angle to the picture plane.
- The size and shape of the object will change according to the angle of projector.

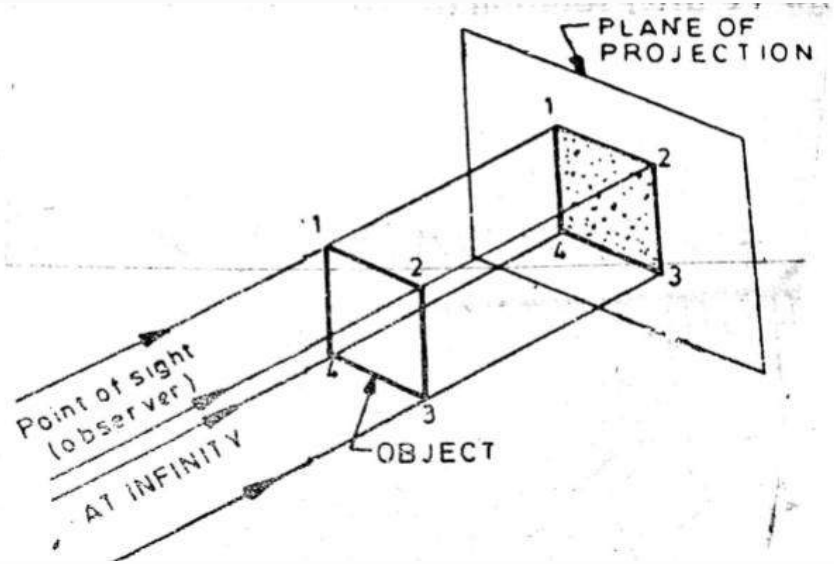


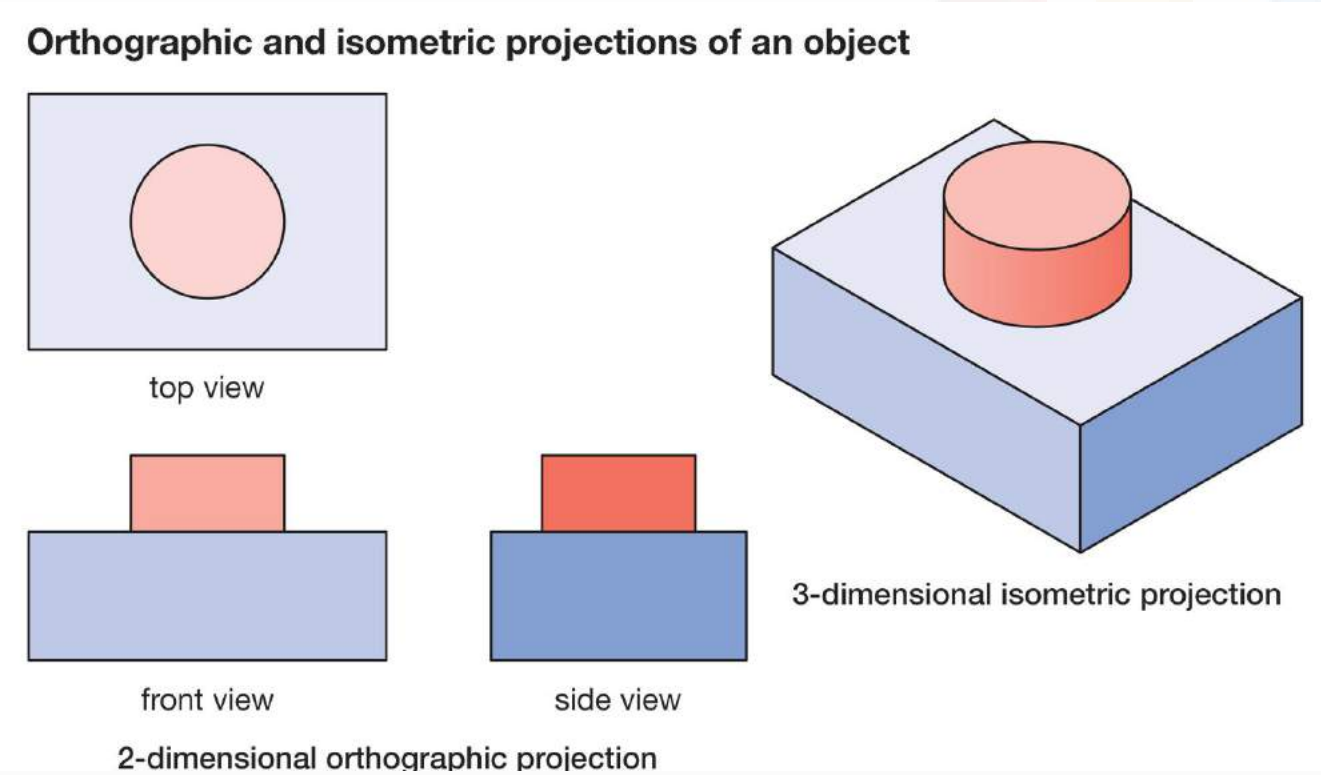


Orthographic Projection

- Projectors or the rays of light are parallel to each other

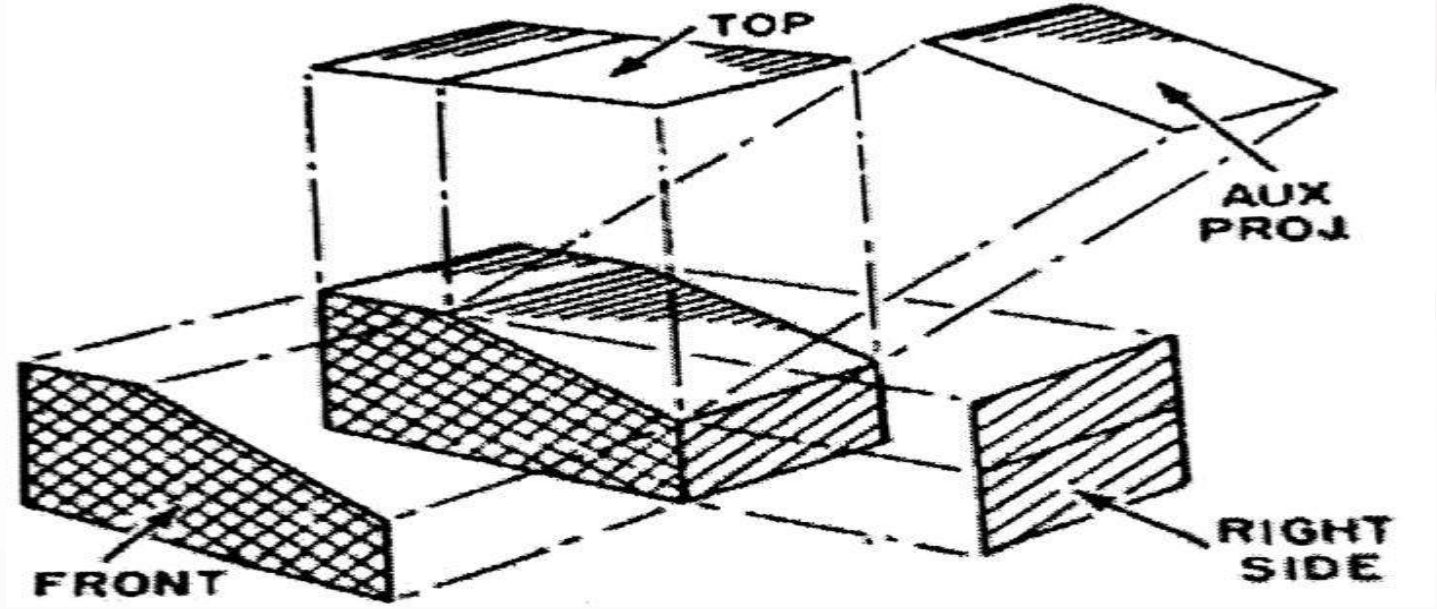
And perpendicular to the picture plane





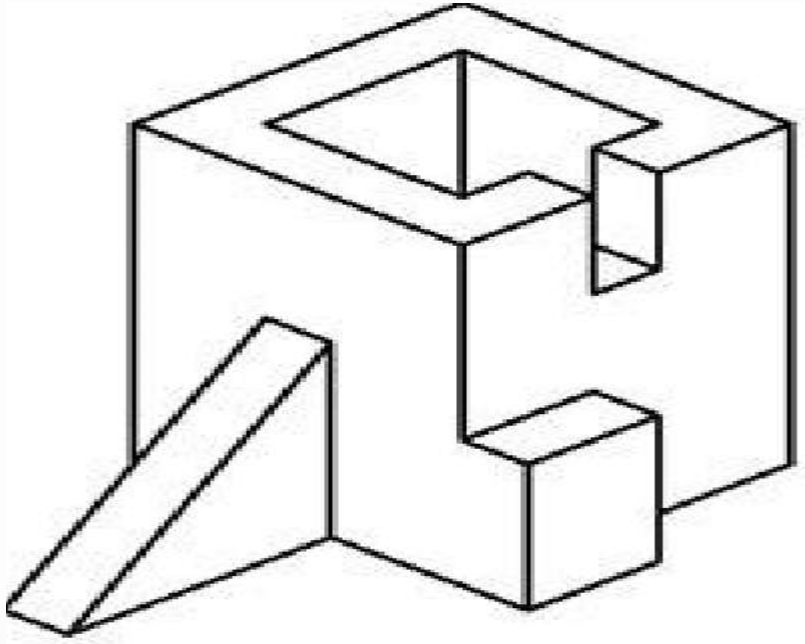
Auxiliary Projection

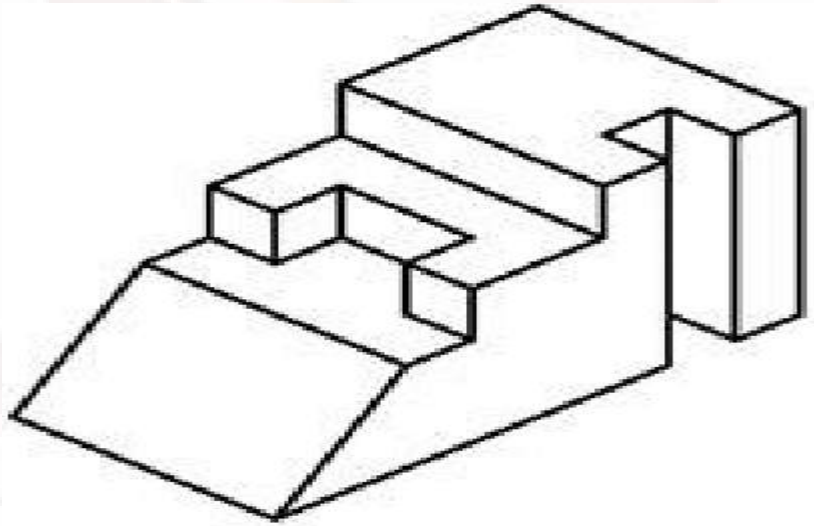
- When the edges of the object is not parallel to the principal plane, then in that case the true shape and size of the object is not projected.
- In order to show such edges and faces in their true shape and size and additional plane known as auxiliary plane is used.



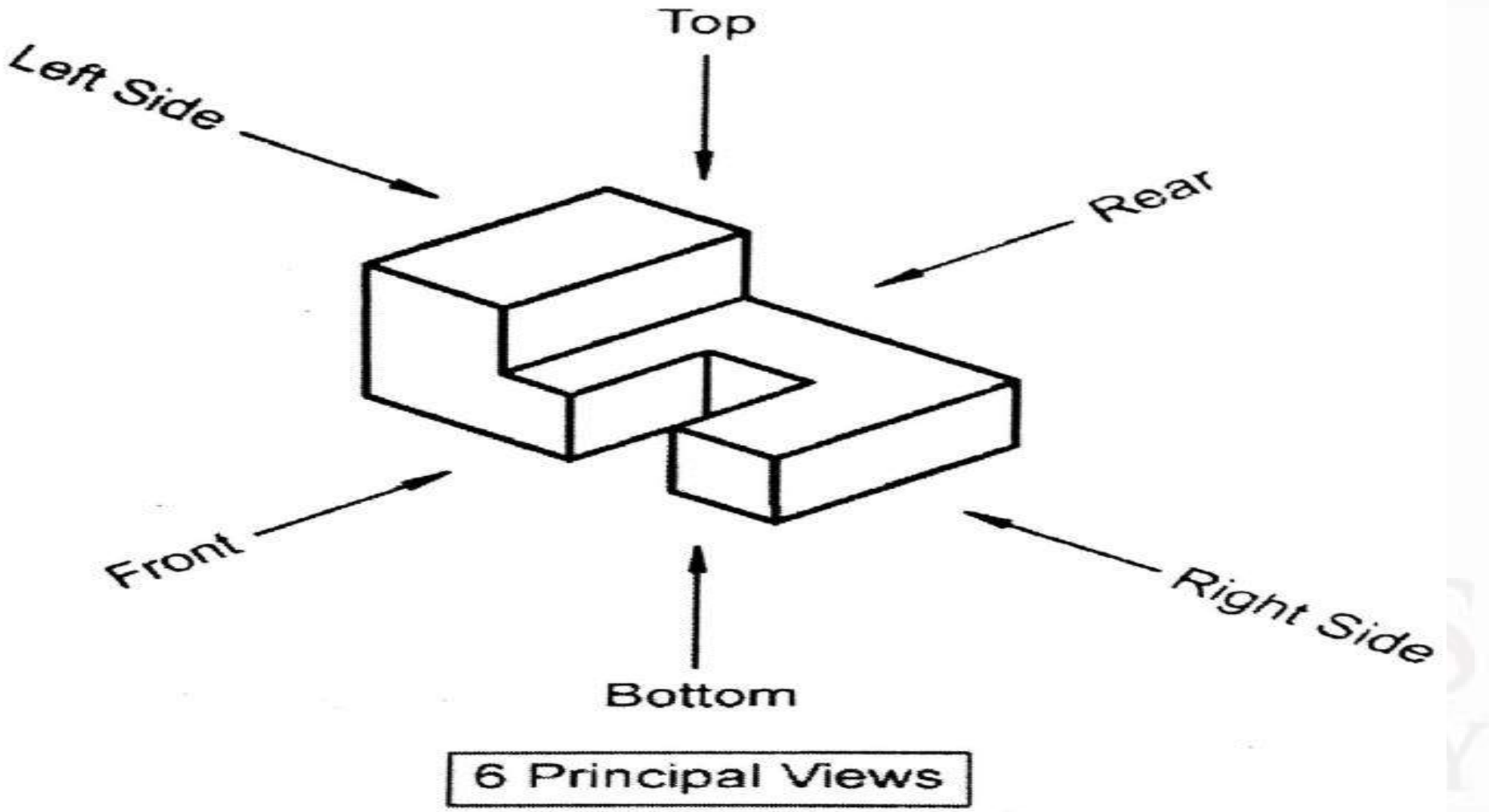
Isometric Projection

Isometric projection is a method for visually representing three-dimensional objects in two dimensions in technical and engineering drawings. It is an axonometric projection in which the three coordinate axes appear equally foreshortened.





Six Principal Views

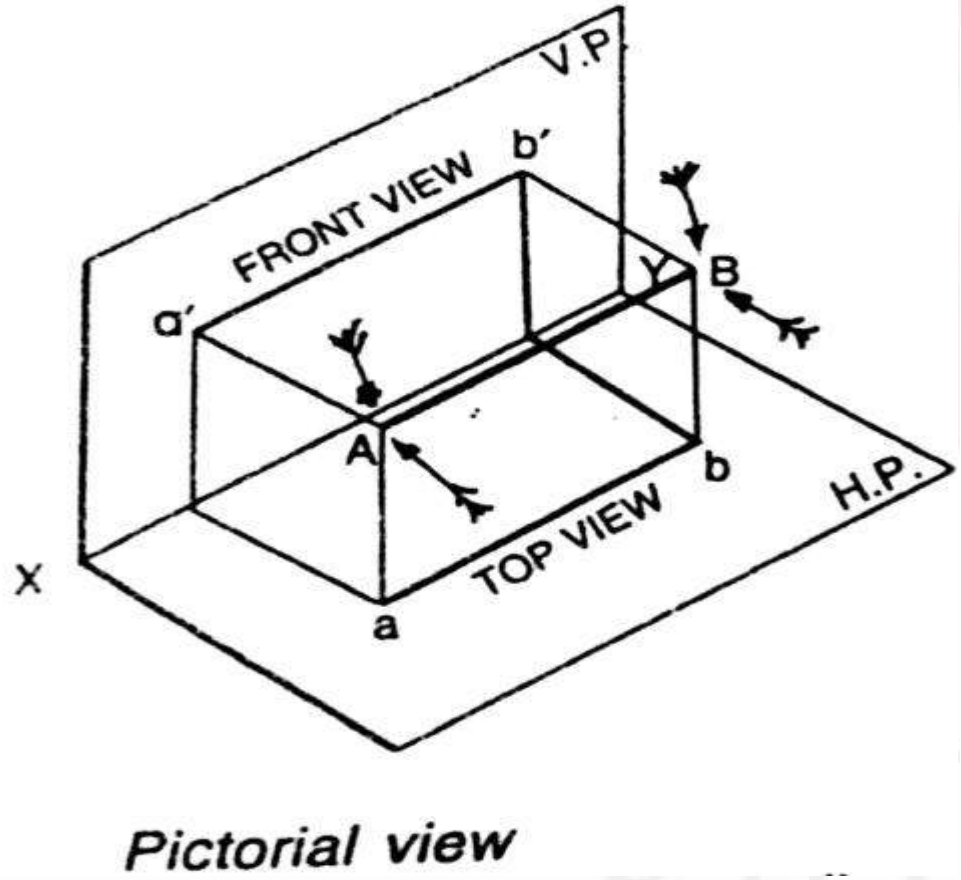


6 Principal Views

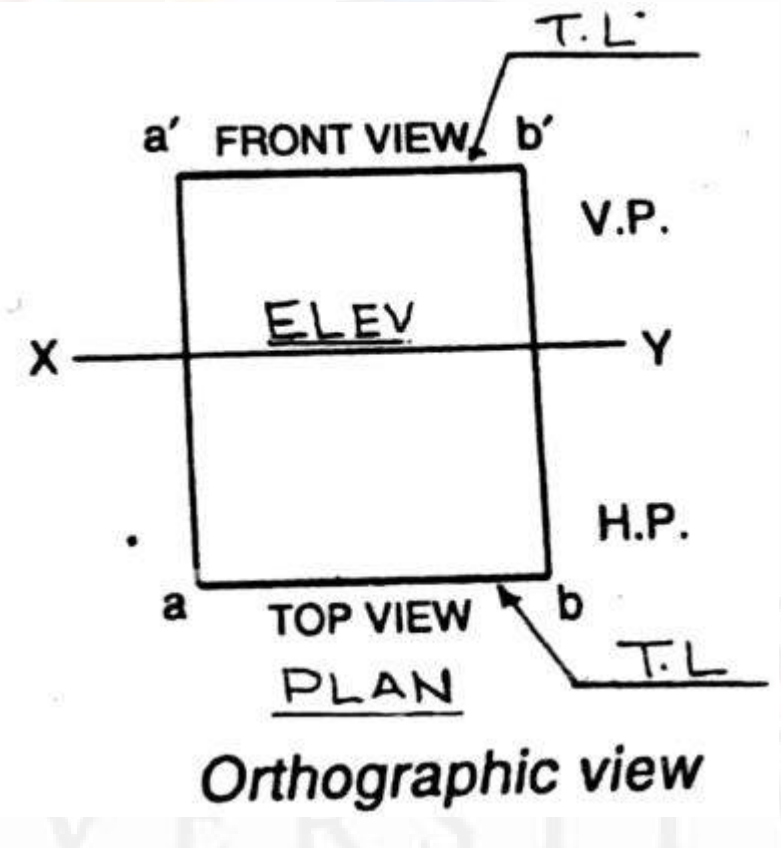
Different Cases of Projection of Straight Line

- Straight line parallel to H.P. and V.P.
- Straight line perpendicular to H.P. and parallel V.P.
- Straight line parallel to H.P. and perpendicular to V.P.
- Straight line in H.P.
- Straight line in V.P.
- Straight line in H.P. And V.P.
- Straight line inclined to H.P. and parallel V.P.
- Straight line inclined to V.P. and parallel H.P.
- Straight line inclined to H.P. and V.P.

Straight line parallel to H.P. and V.P.

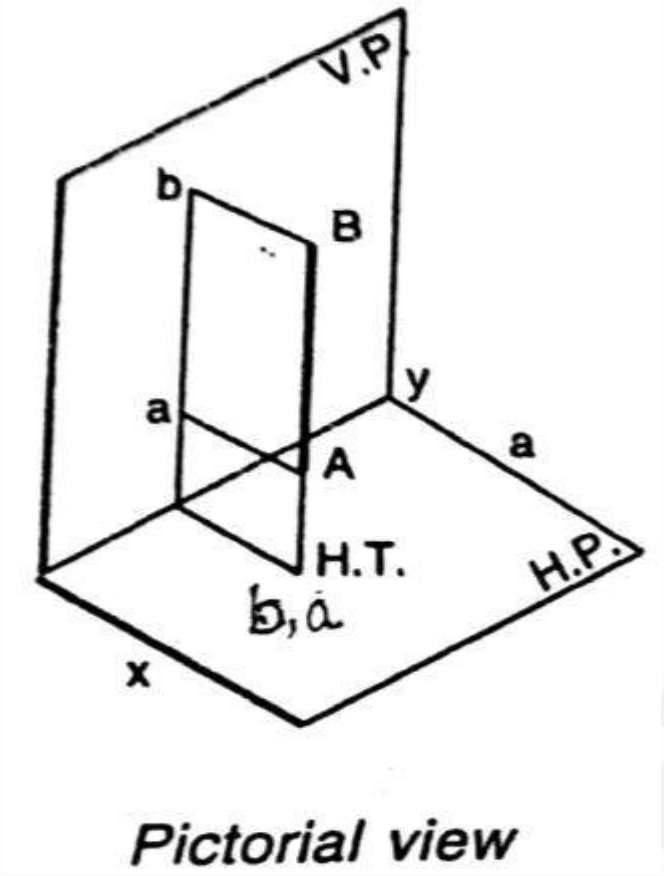


Pictorial view

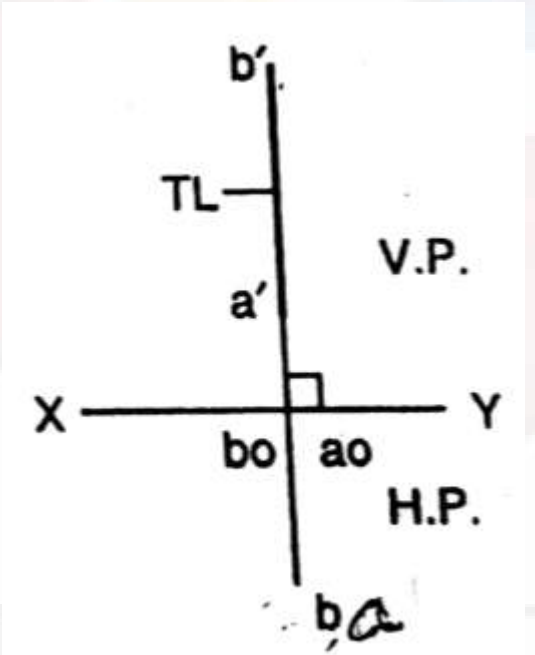


Orthographic view

Straight line perpendicular to H.P. and parallel V.P.

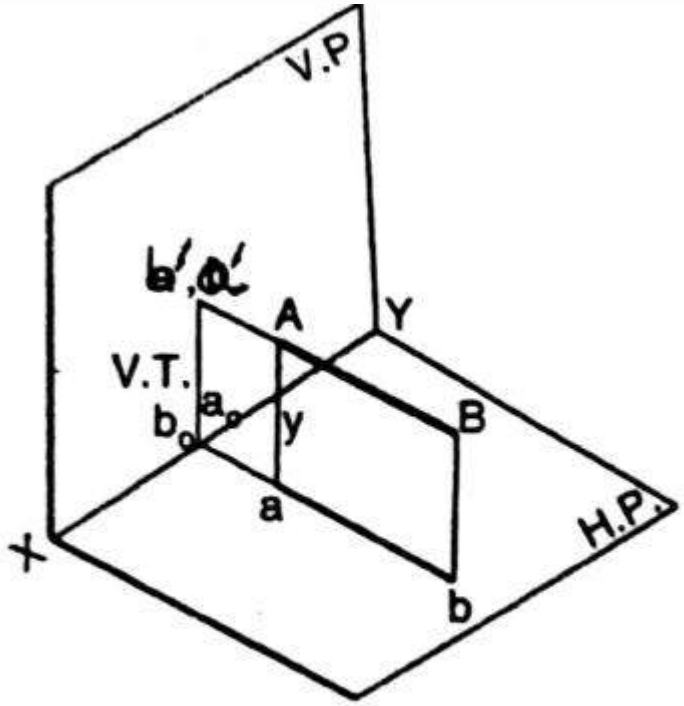


Pictorial view

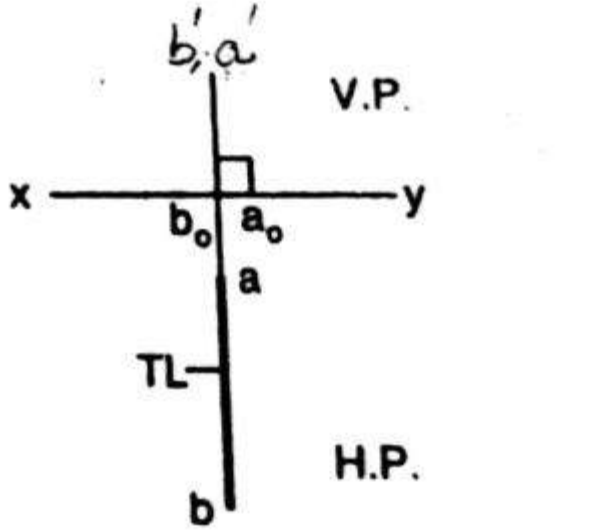


Orthographic views

Straight line parallel to H.P. and perpendicular to V.P.

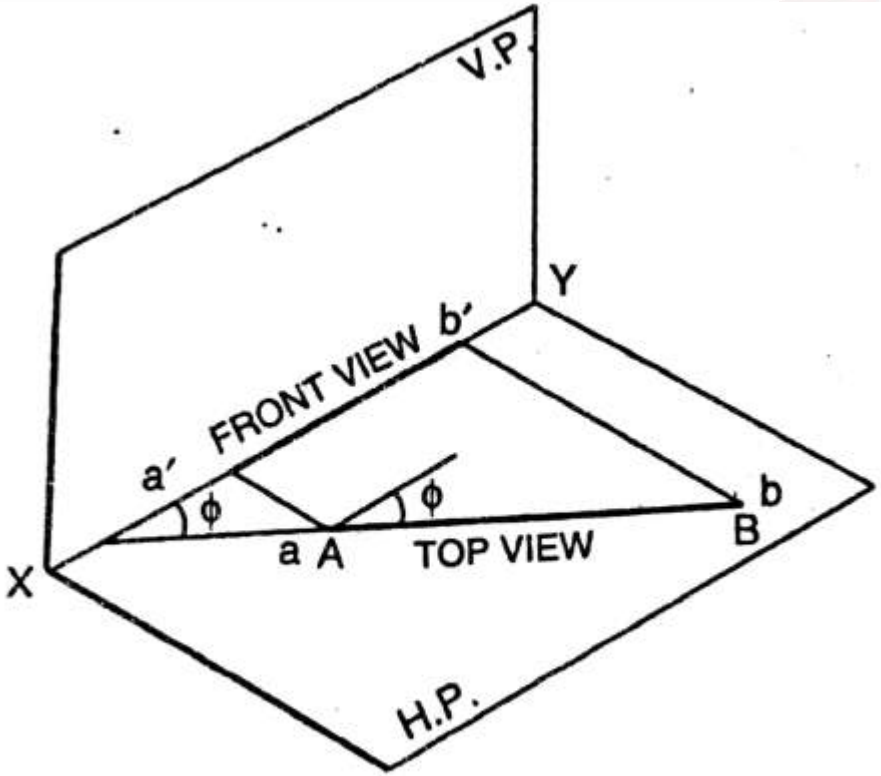


Pictorial view

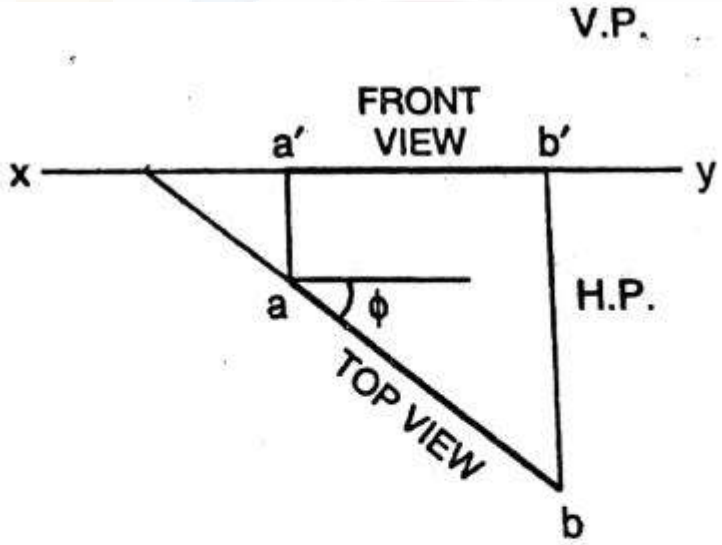


Orthographic views

Straight Line in H.P.

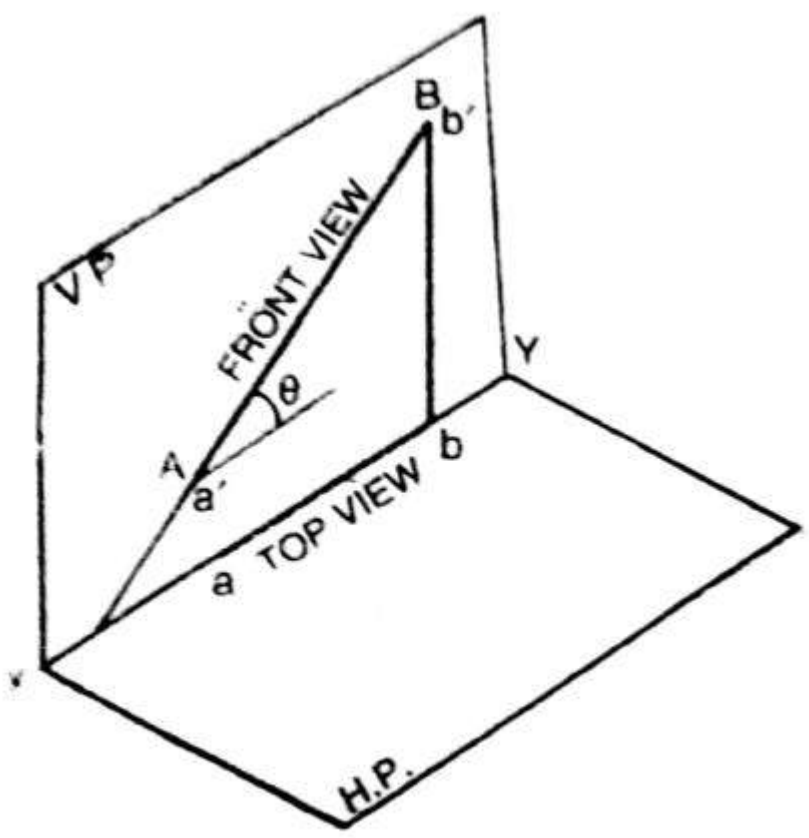


Pictorial view

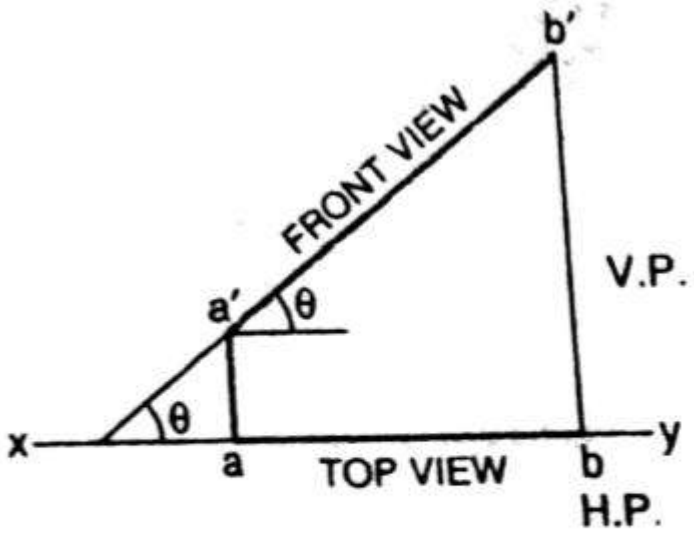


Orthographic views

Straight Line in V.P.

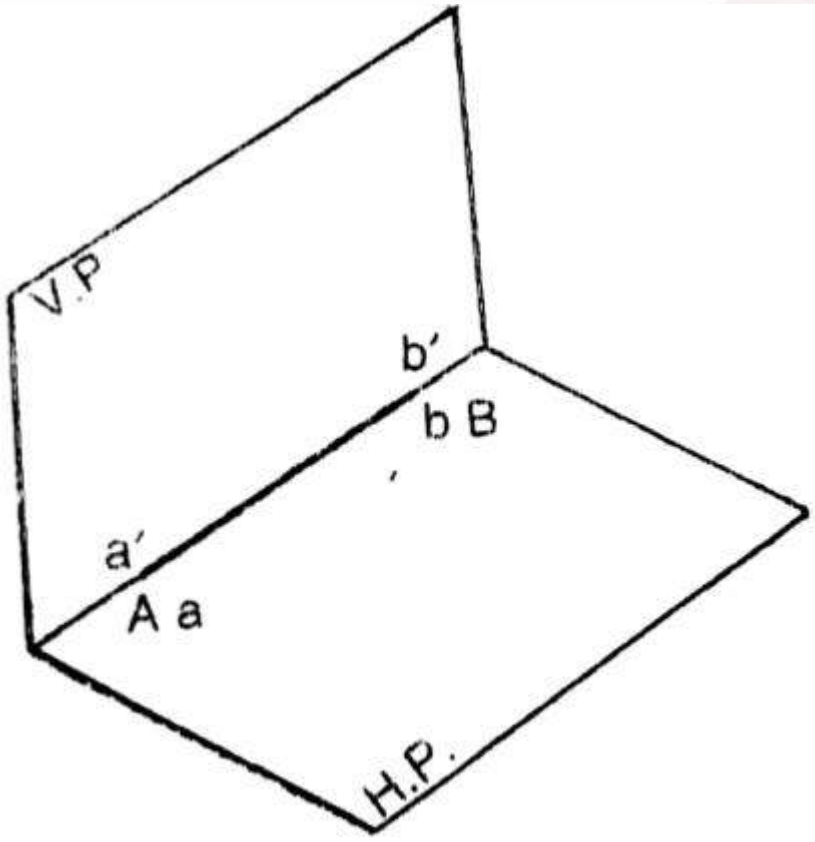


Pictorial view

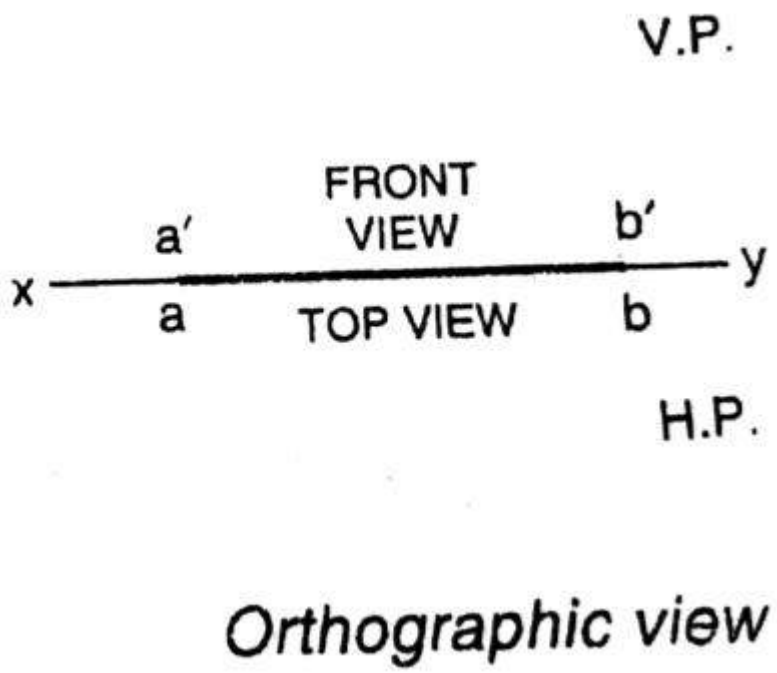


Orthographic views

Straight Line in H.P. and V.P.

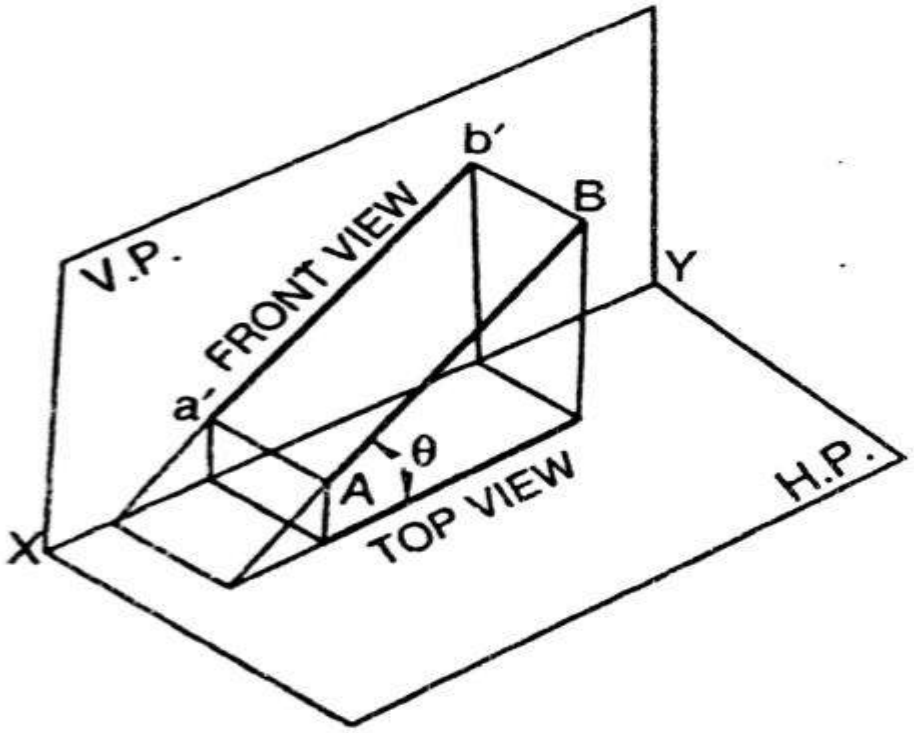


Pictorial view

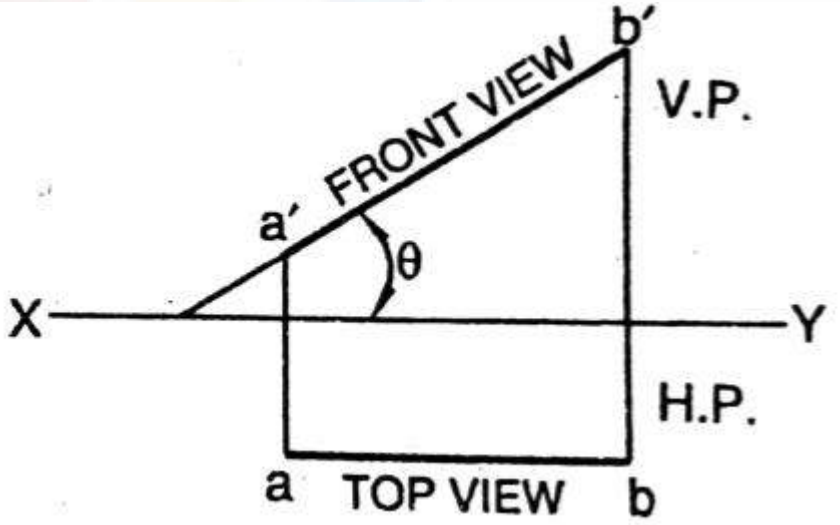


Orthographic view

Straight line inclined to H.P. and parallel V.P.

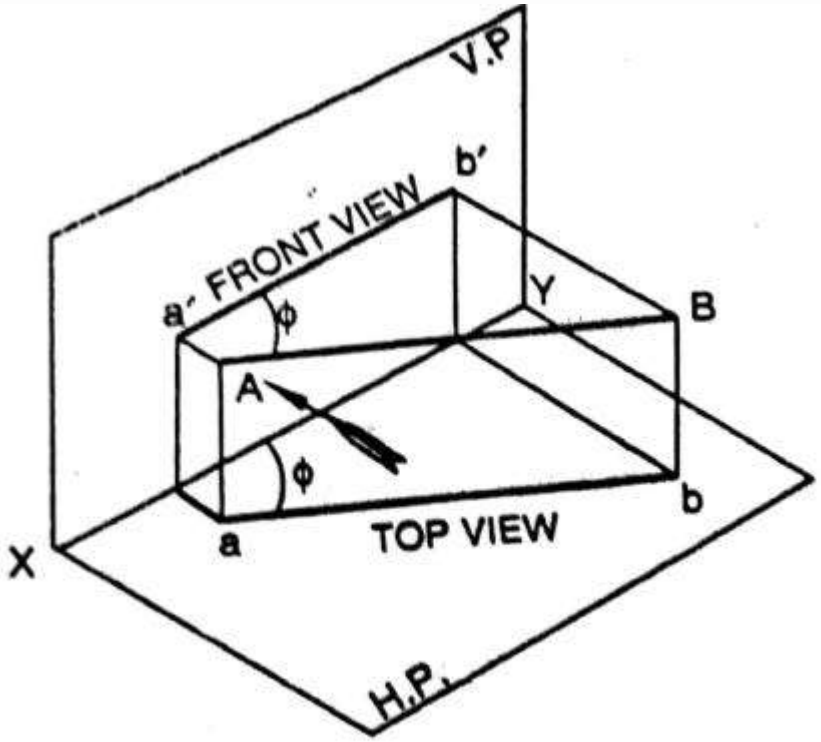


Pictorial view

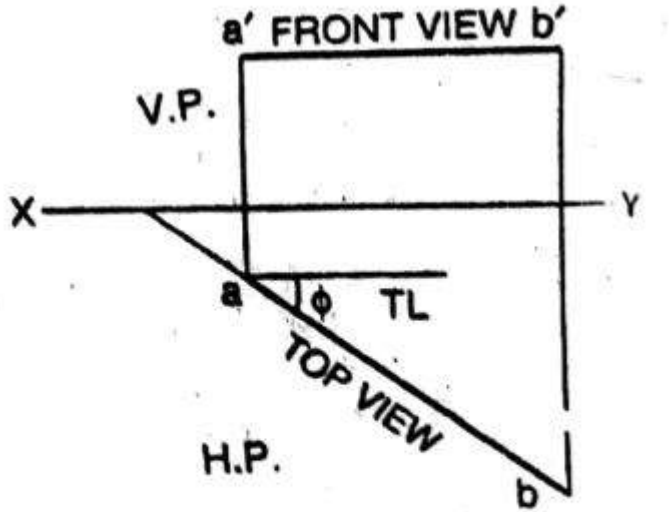


Orthographic views

Straight line inclined to V.P. and parallel H.P.

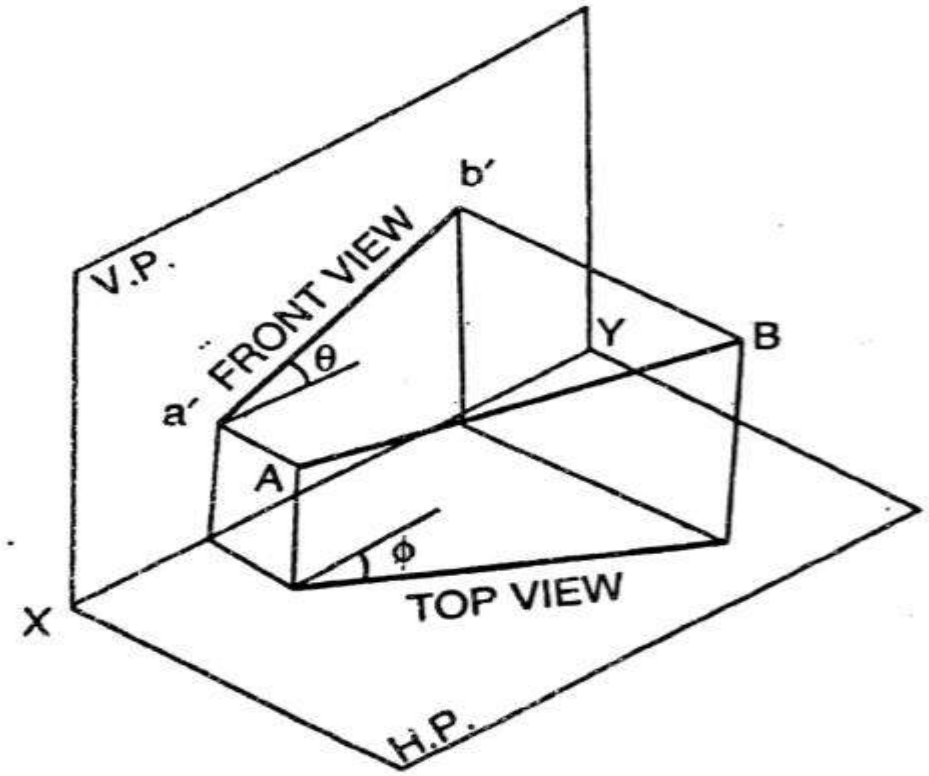


Pictorial view

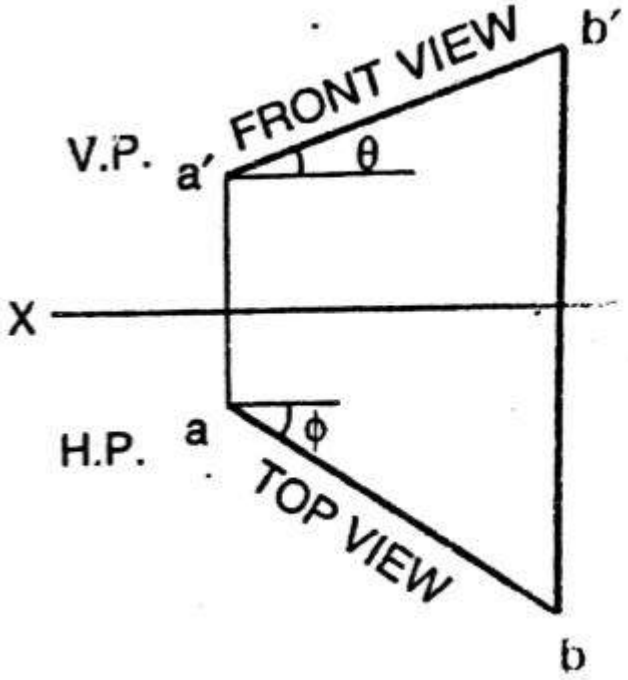


Orthographic views

Straight Line inclined to H.P. and V.P.



Pictorial view



Orthographic views

Video for Visualization

Summary

Learners are able to draw:

- Straight line parallel to H.P. and V.P.
- Straight line perpendicular to H.P. and parallel V.P.
- Straight line parallel to H.P. and perpendicular to V.P.
- Straight line in H.P.
- Straight line in V.P.
- Straight line in H.P. And V.P.
- Straight line inclined to H.P. and parallel V.P.
- Straight line inclined to V.P. and parallel H.P.
- Straight line inclined to H.P. and V.P.

Questions

- **How do you explain the t**ypes of projection:
  - Perspective
  - Oblique
  - Auxiliary
  - Orthographic
  - Isometric
- Explain the orthographic system of projection
- Explain the principal planes
- Write the convention for projection
- Explain the different cases of projection of lines

References

- Engineering Drawing by N. D. Bhatt and V. M. Panchal
- Engineering Graphics by K. C. John
- NPTEL

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Thank You