



**CE 181103**

**1<sup>st</sup> Semester  
Civil & Chemical  
Engg.**

# **Engineering Graphics and Design**

**M-2: Orthographic  
Projection**

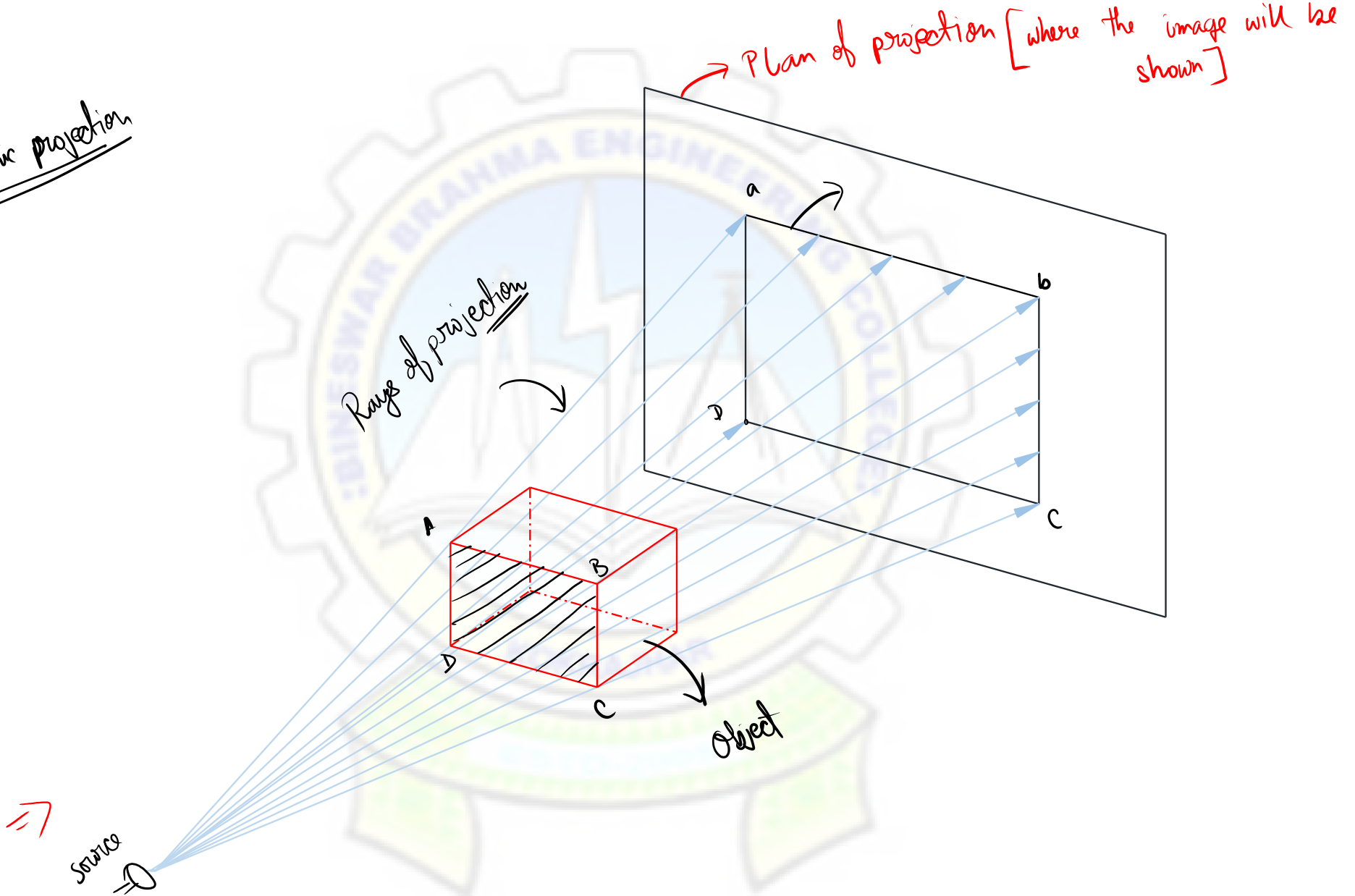
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## MODULE 2: Orthographic Projections (14 Lectures)

- i. Principles of Orthographic Projections- Conventions
- ii. Projection of points : Introduction of projection, quadrants, 1<sup>st</sup> , 2<sup>nd</sup> , 3<sup>rd</sup> and 4<sup>th</sup> angle projection of points.
- iii. Projection of lines (First angle only) : Line parallel to one or both planes, line perpendicular to a plane, line inclined to one plane and parallel to other, line inclined to both plane.
- iv. Projections of planes (First angle only): Plane perpendicular to one plane and parallel to other, plane perpendicular to both plane, plane inclined to one plane and perpendicular to other.
- v. Projection of solids (First angle only) : Axis perpendicular to one plane and parallel to other, axis parallel to both plane, axis inclined to one plane and parallel to other, axis inclined to both plane.

Projection:

Orthographic projection

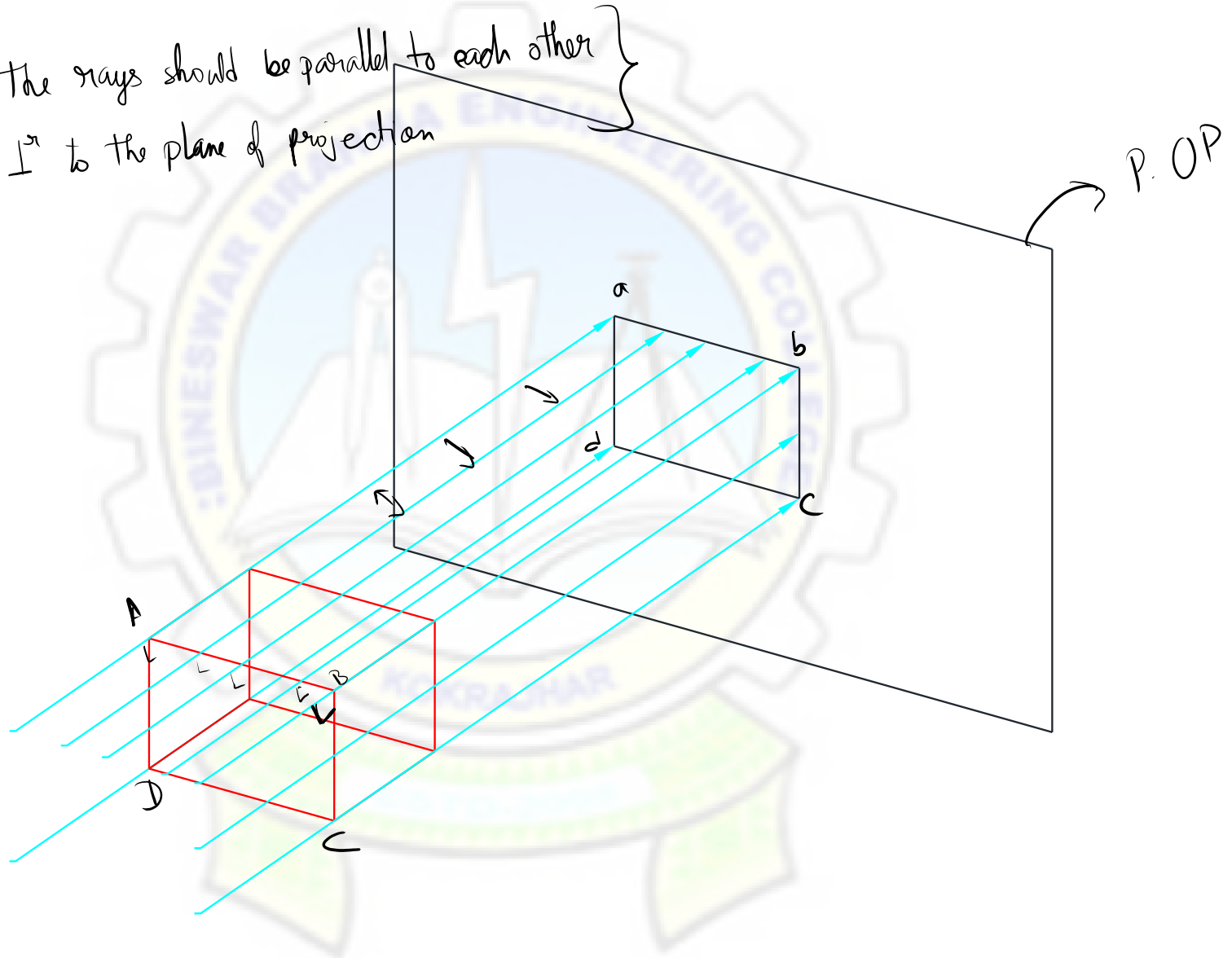


# Orthographic projection:

2 conditions  $\rightarrow$  ① The rays should be parallel to each other

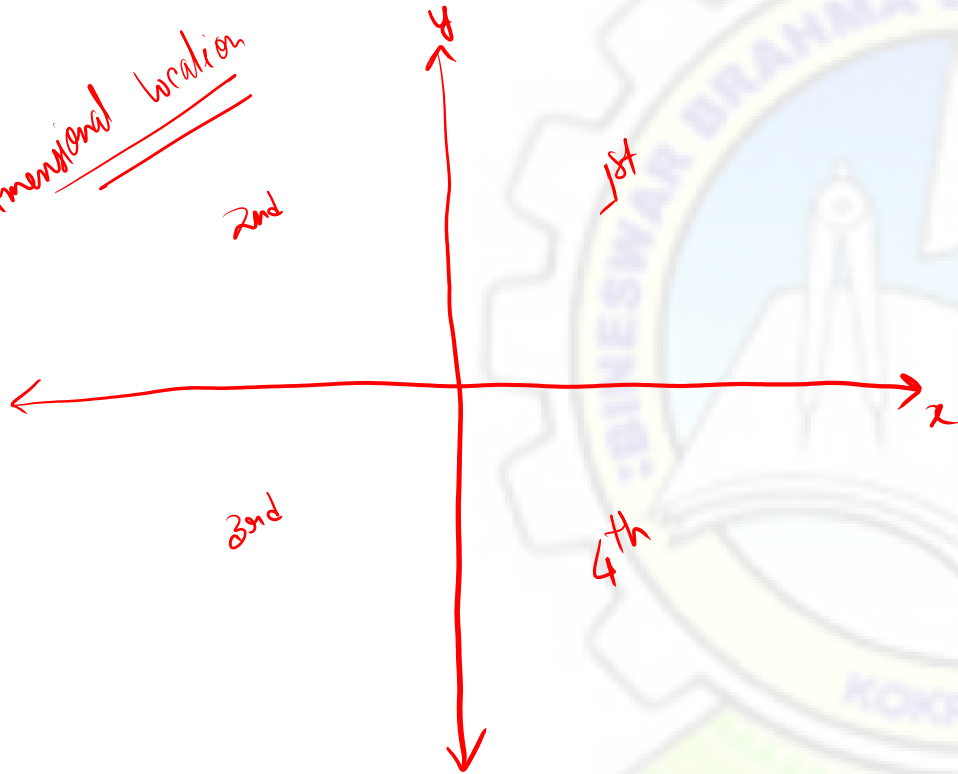
② Ray should be  $\perp$  to the plane of projection

$$AB = ab$$



# Quadrants & type of projection angles:

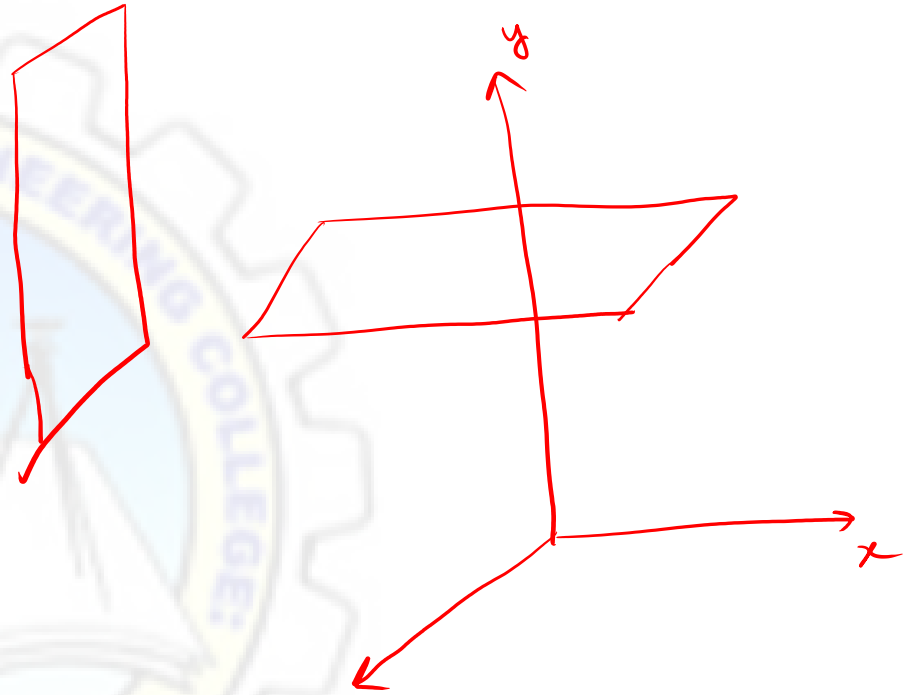
2 dimensional location  
2nd



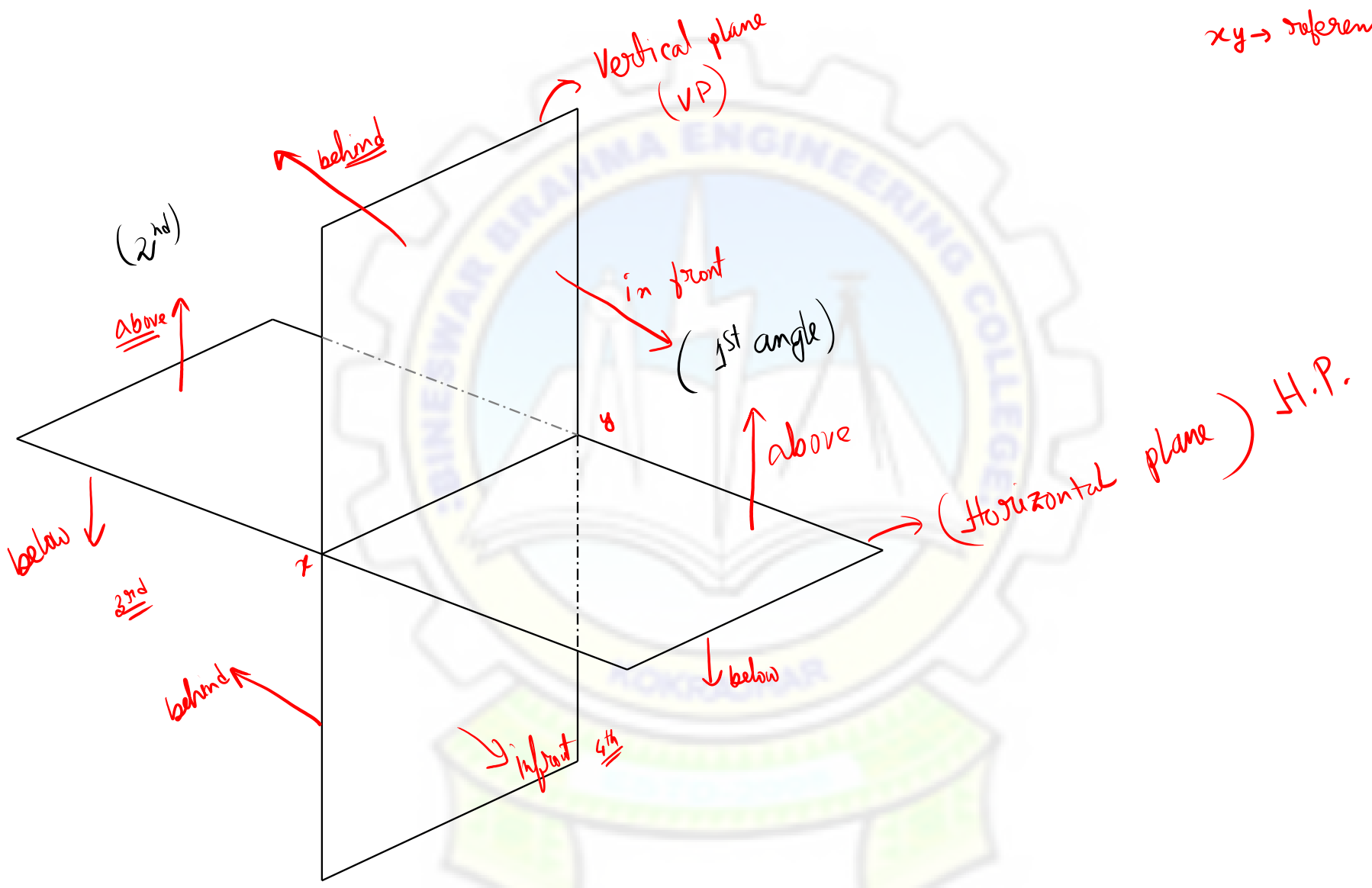
1st

4th

3rd



$xy \rightarrow$  reference line



## Types of projection angles

- (i) 1<sup>st</sup> angle projection  $\rightarrow$  (1<sup>st</sup> quadrant)  $\rightarrow$  Above H.P  
in front of V.P
- (ii) 2<sup>nd</sup> angle  $\rightarrow$  (2<sup>nd</sup> quadrant)  $\rightarrow$  Above H.P, behind V.P
- (iii) 3<sup>rd</sup> angle  $\rightarrow$  (3<sup>rd</sup>)  $\rightarrow$  below H.P, behind V.P
- (iv) 4<sup>th</sup> angle  $\rightarrow$  (4<sup>th</sup>)  $\rightarrow$  below H.P, in front of V.P

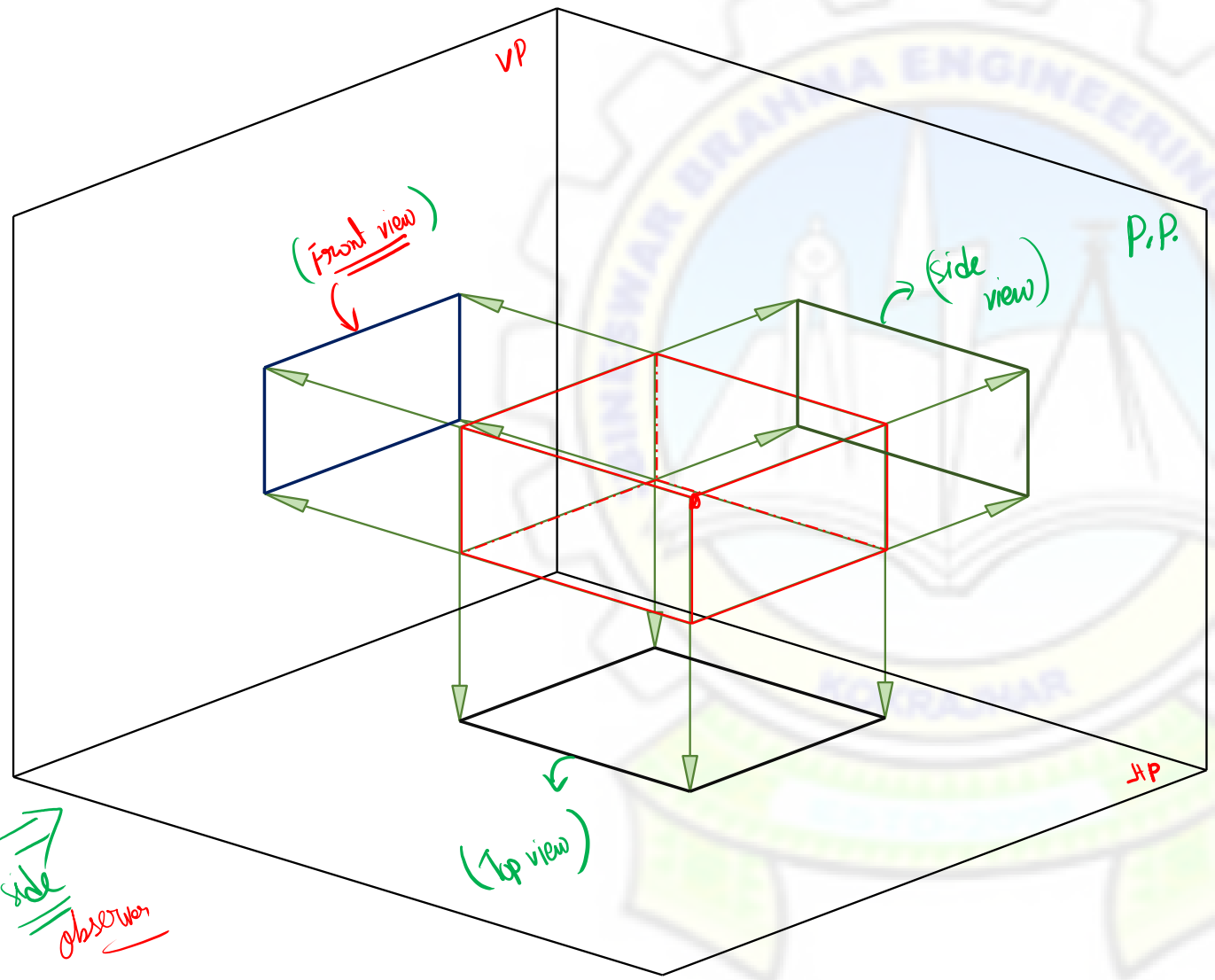





\* 1st angle projection:

Top  Obser

 layout of projection planes



 Observer  $\rightarrow$  object  $\rightarrow$  P. DP  
(Locations)

Obser

side  
observer

(Front)

Thank You

