

Chapter 6

Orthographic Projection Concept

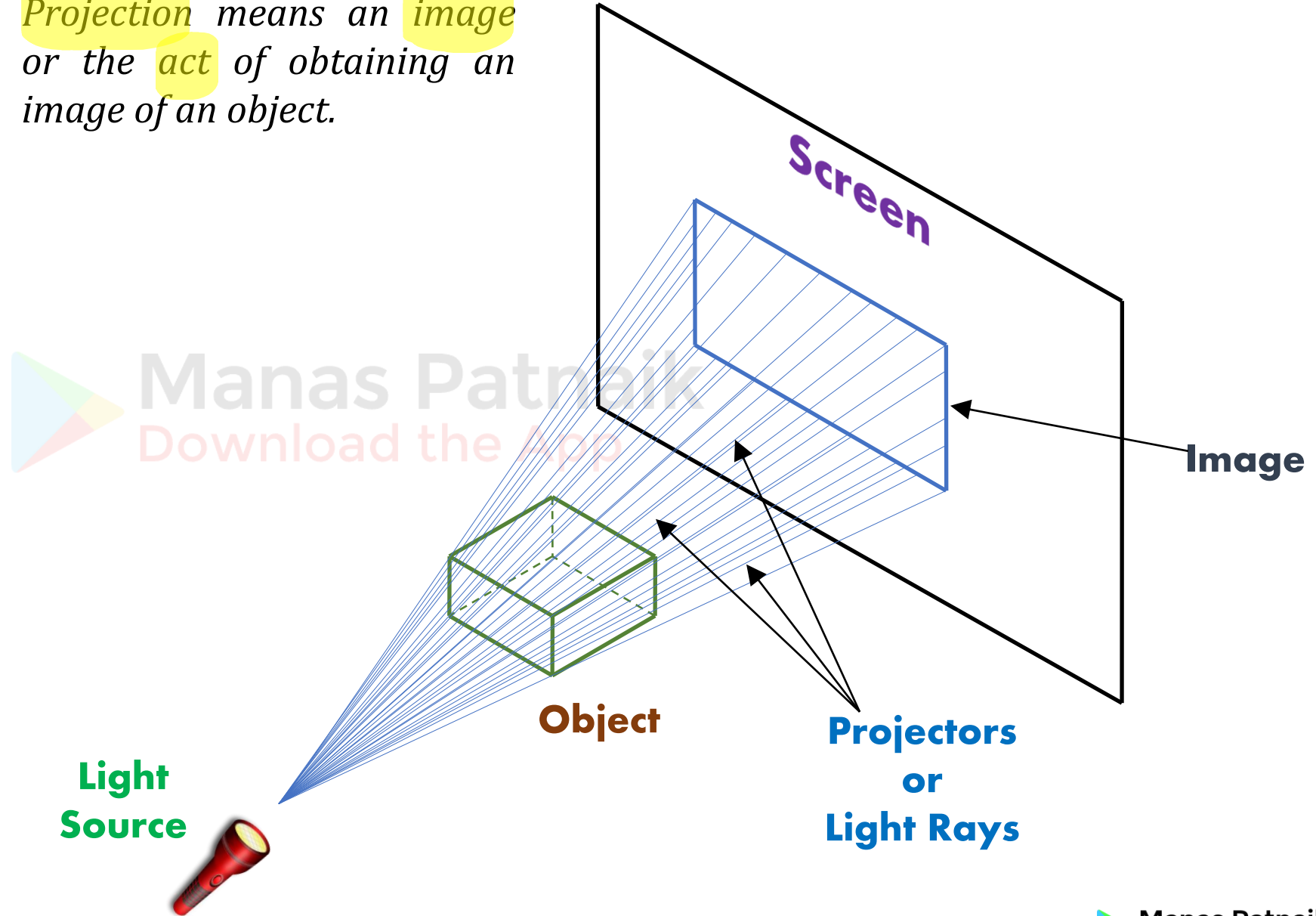
- What is Projection?
- What is Orthographic Projection?
- Principal Planes, Quadrants & Type of Views
- First Angle Projection
- Third Angle Projection
- Differences between I & III Angle Projection
- Symbols
- Why projection is not done in II & IV Quadrant



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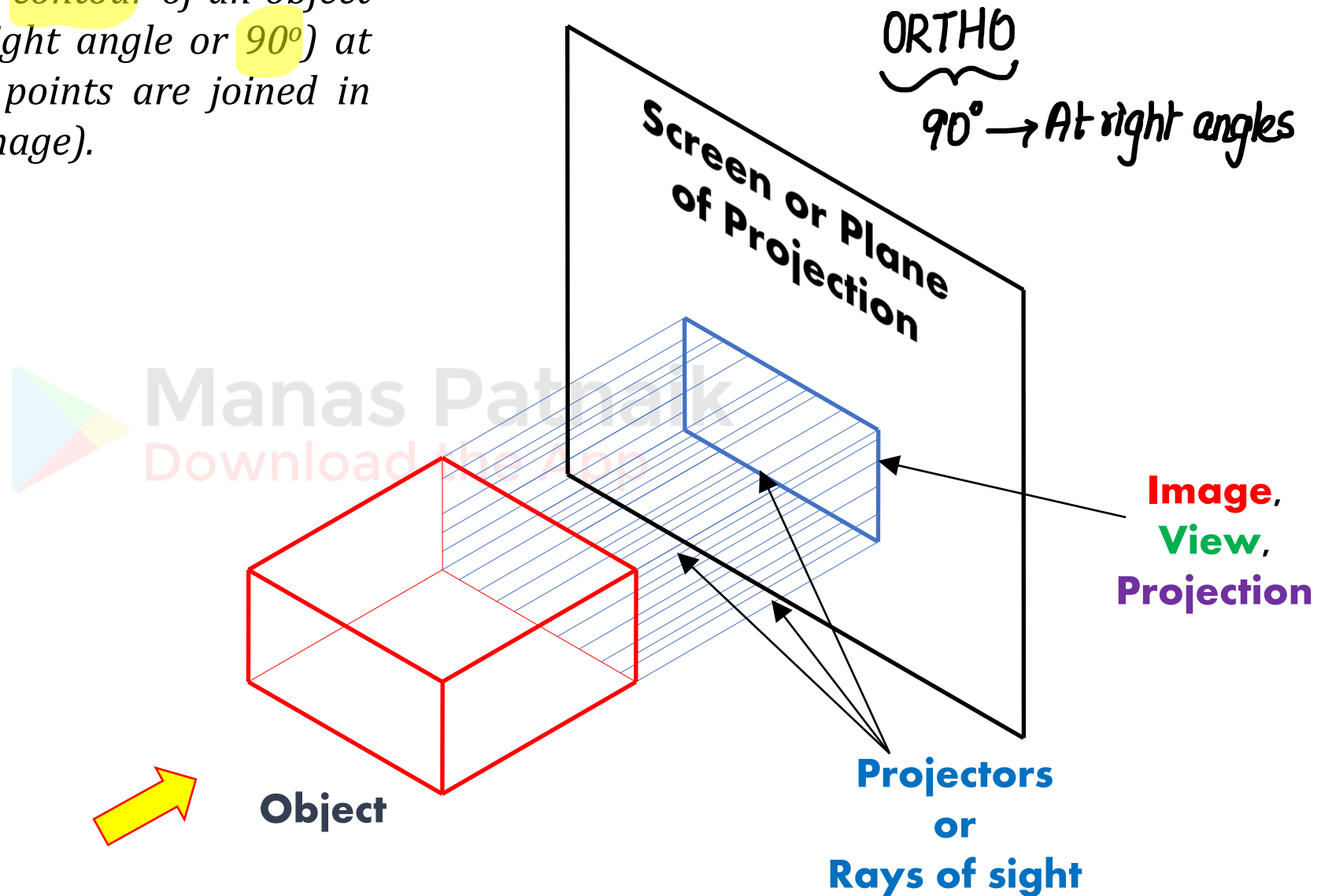
1. What is Projection?

Projection means an image or the act of obtaining an image of an object.



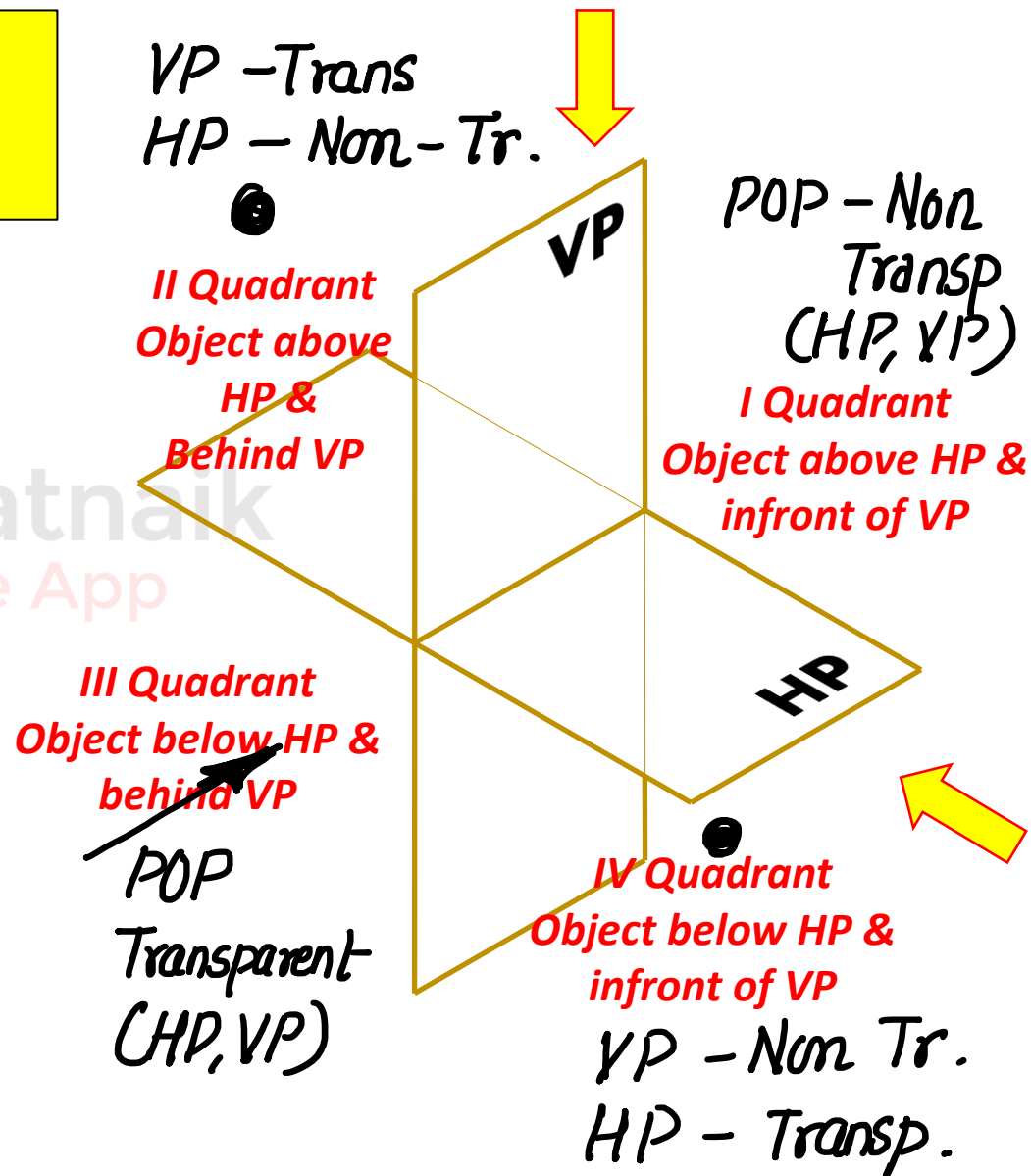
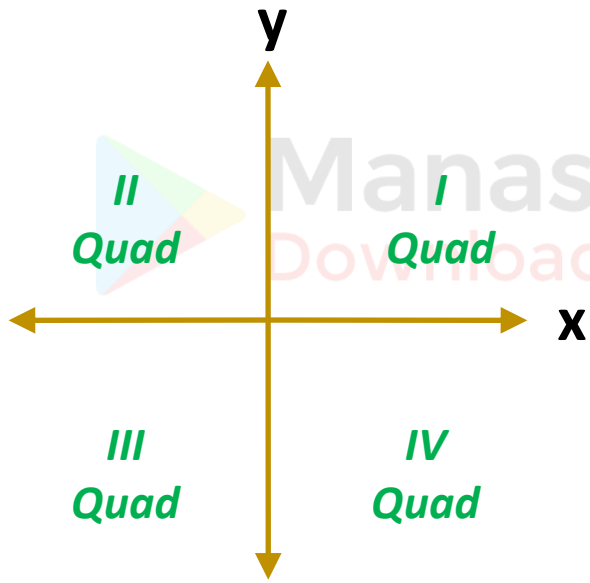
2. What is Orthographic Projection?

Parallel lines are drawn from the **contour** of an object to meet a plane orthogonally (right angle or 90°) at various points, and when these points are joined in proper sequence we get a **view** (image).



3. Principal Planes, Quadrants and Type of Views

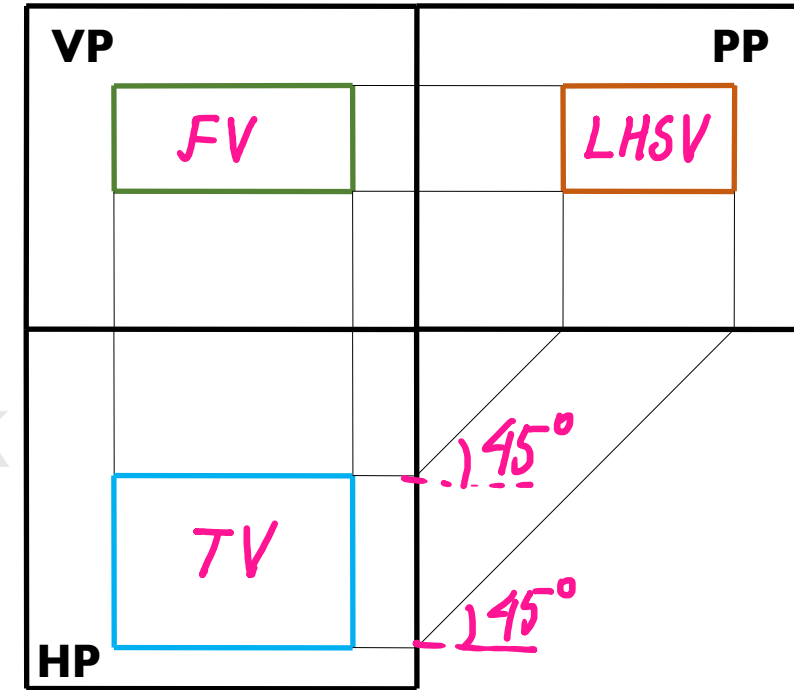
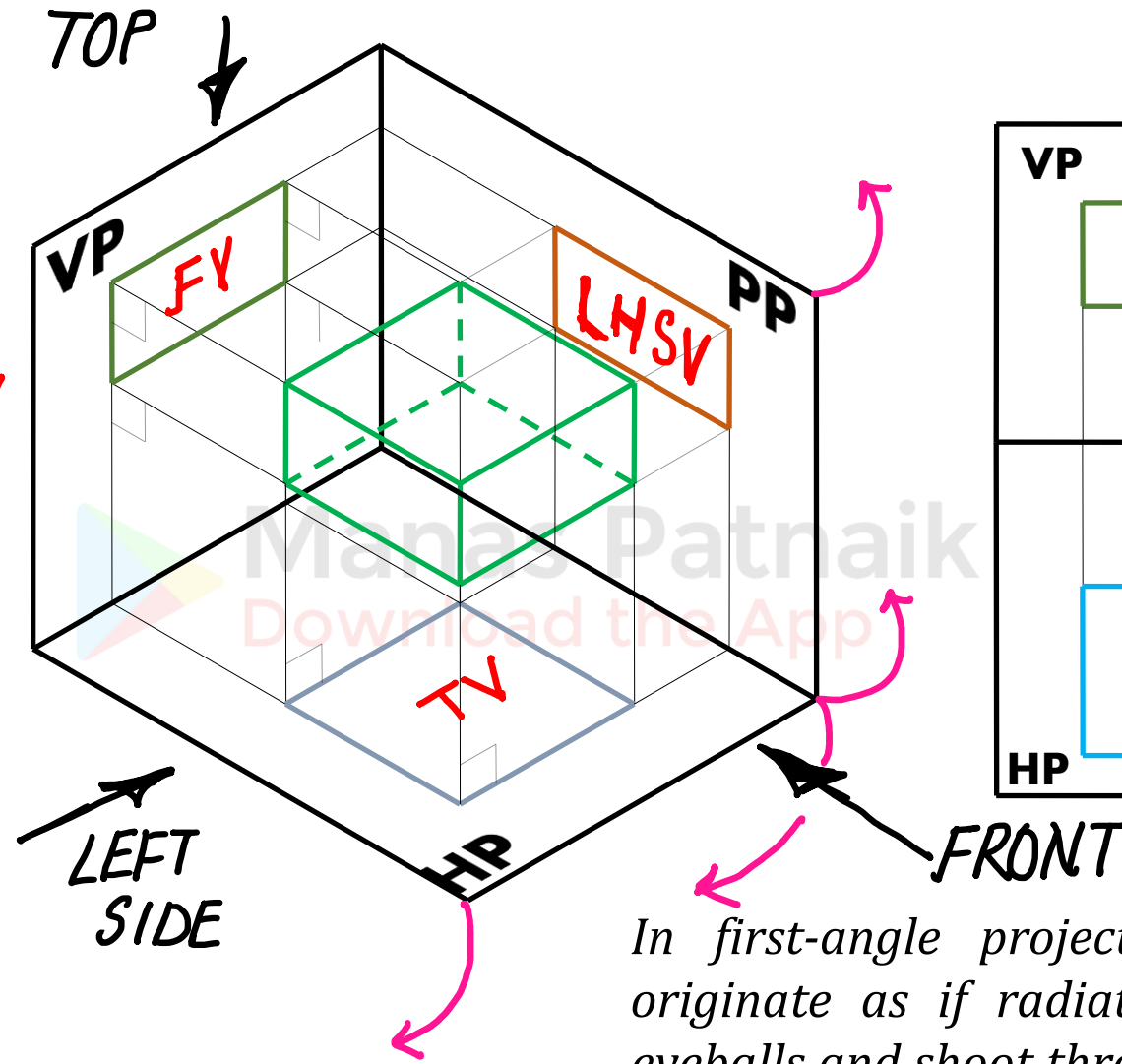
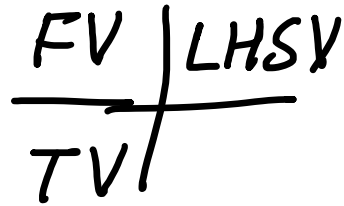
- a. Principal planes
- b. Quadrants
- c. views



4. First Angle Projection

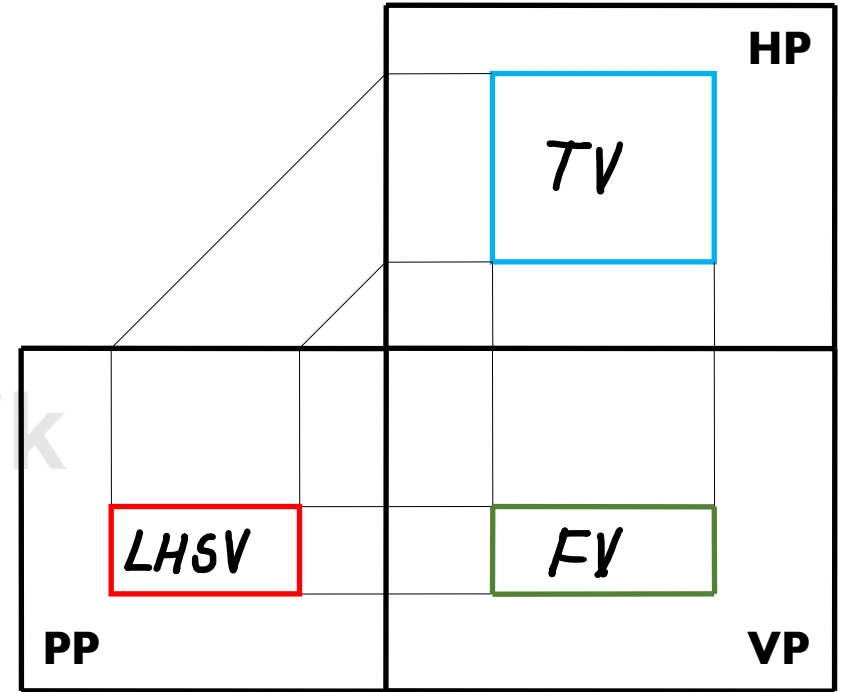
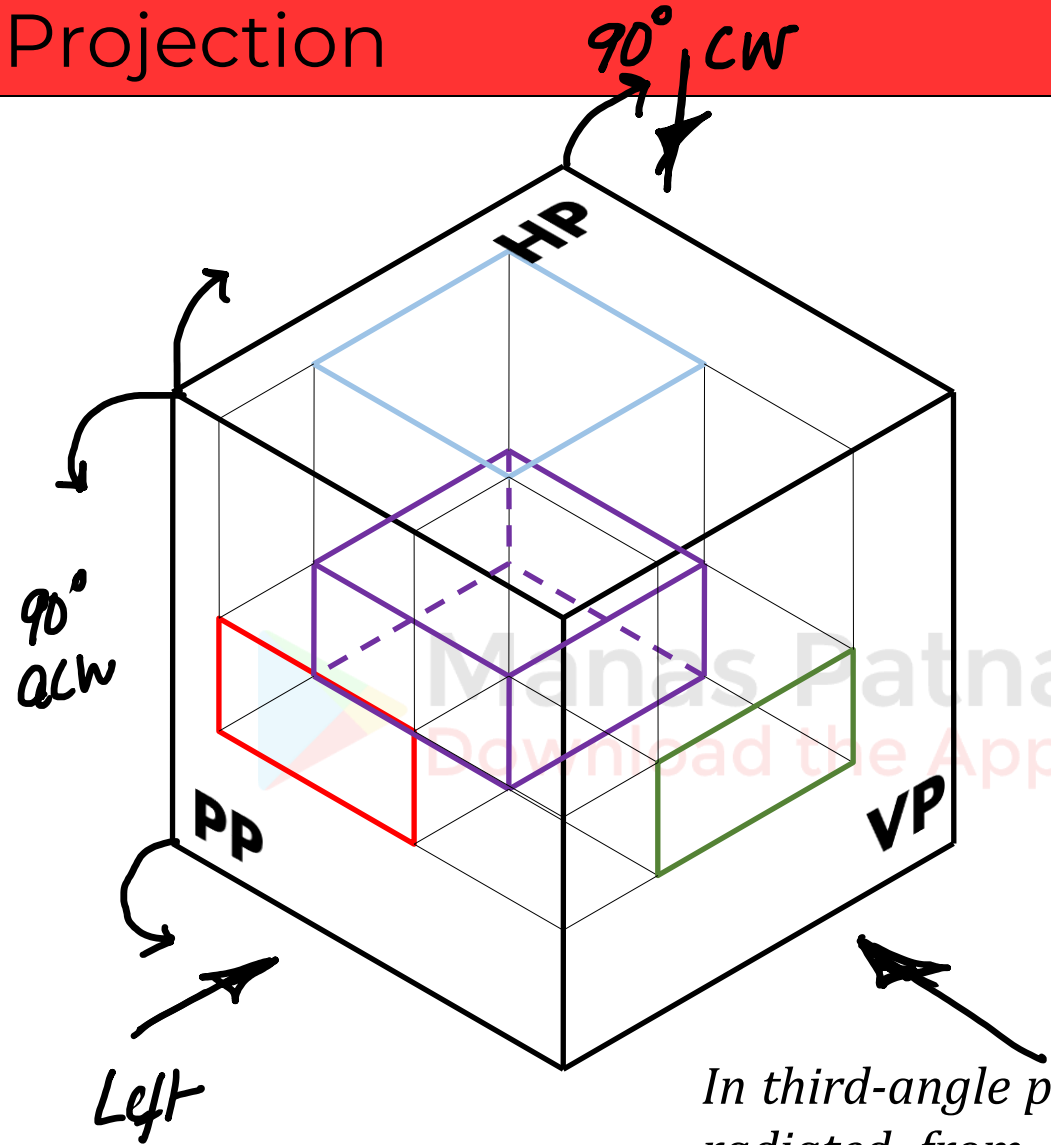
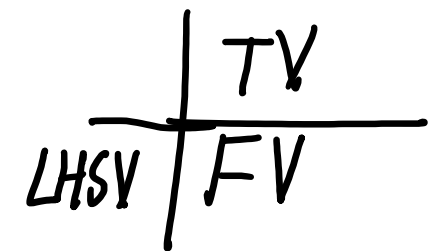
PP → Profile Plane {SIDE VIEWS}

- ① VP → FV
- ② HP → TV
- ③ PP → LHSV
- ④ HP → Rotate 90° CW
- ⑤ PP → " — " — a.c.w



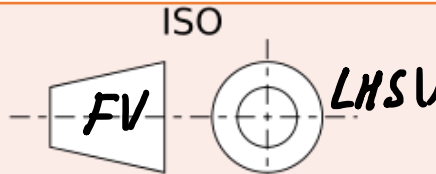
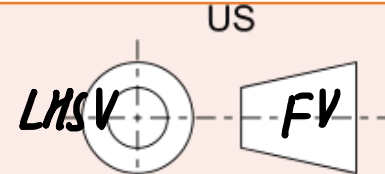
In first-angle projection, the projectors originate as if radiated from a viewer's eyeballs and shoot through the 3D object to project a 2D image onto the plane behind it

5. Third Angle Projection



In third-angle projection, the projectors originate as if radiated from the 3D object itself and shoot away from the 3D object to project a 2D image onto the plane in front of it.

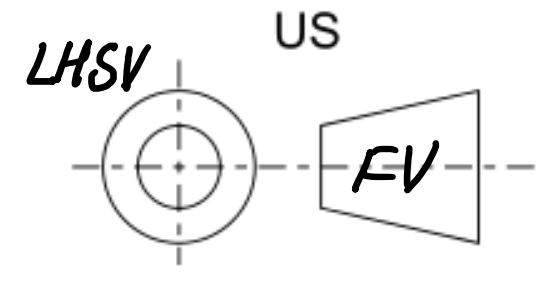
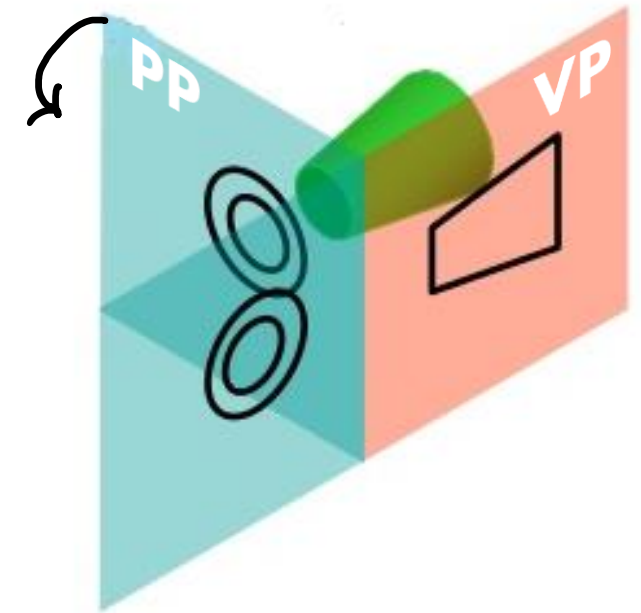
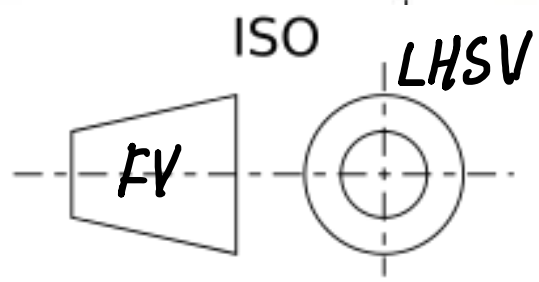
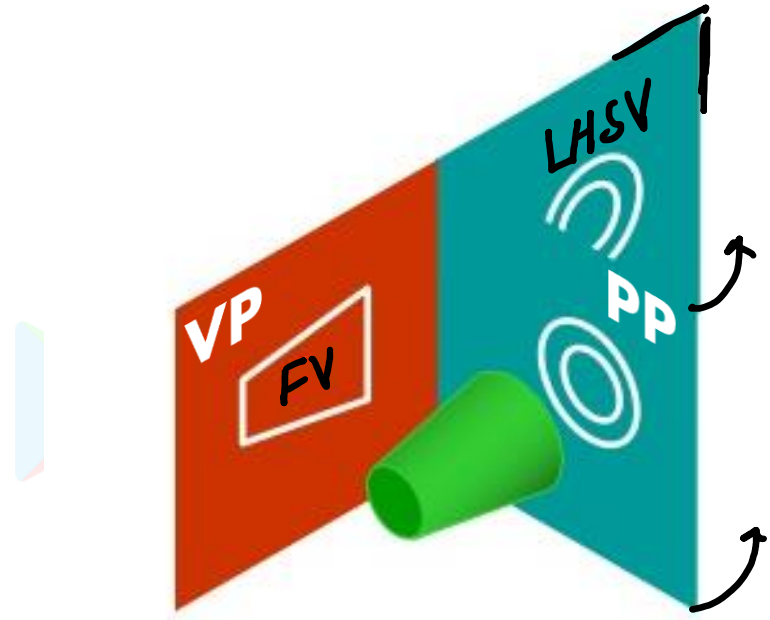
6. Differences between I and III Angle Projection

1.	Object is assumed above HP and in front of VP.	Object is assumed below HP and behind VP.
2.	POP is Non-Transparent.	POP is Transparent.
3.	VP is above xy line and HP below xy line.	HP is above xy line and VP below xy line.
4.	LHSV is to the right of FV	LHSV is to the left of FV
5.	Used in India, Russia and some European countries	Used in USA
6.	 <p>ISO</p>	 <p>US</p>

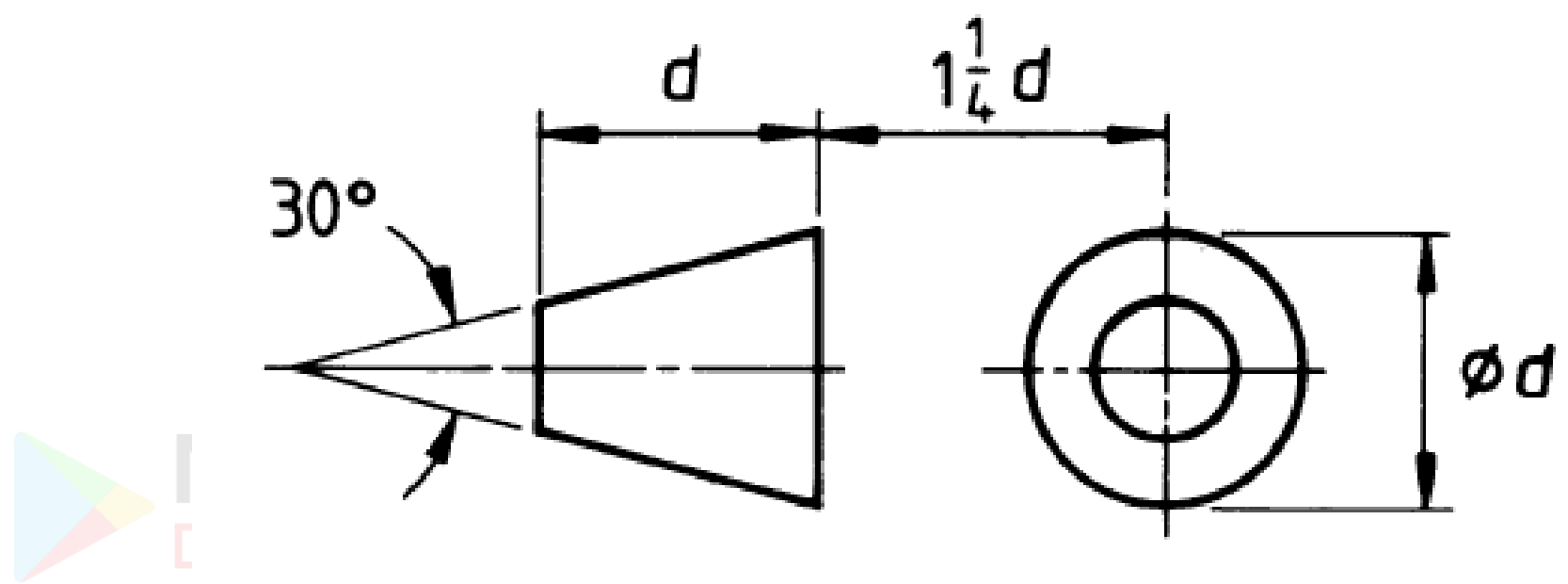
7. Symbols of I and III Angle Projection

OBS — OBJ — POP
First Angle Projection Non-Tr.

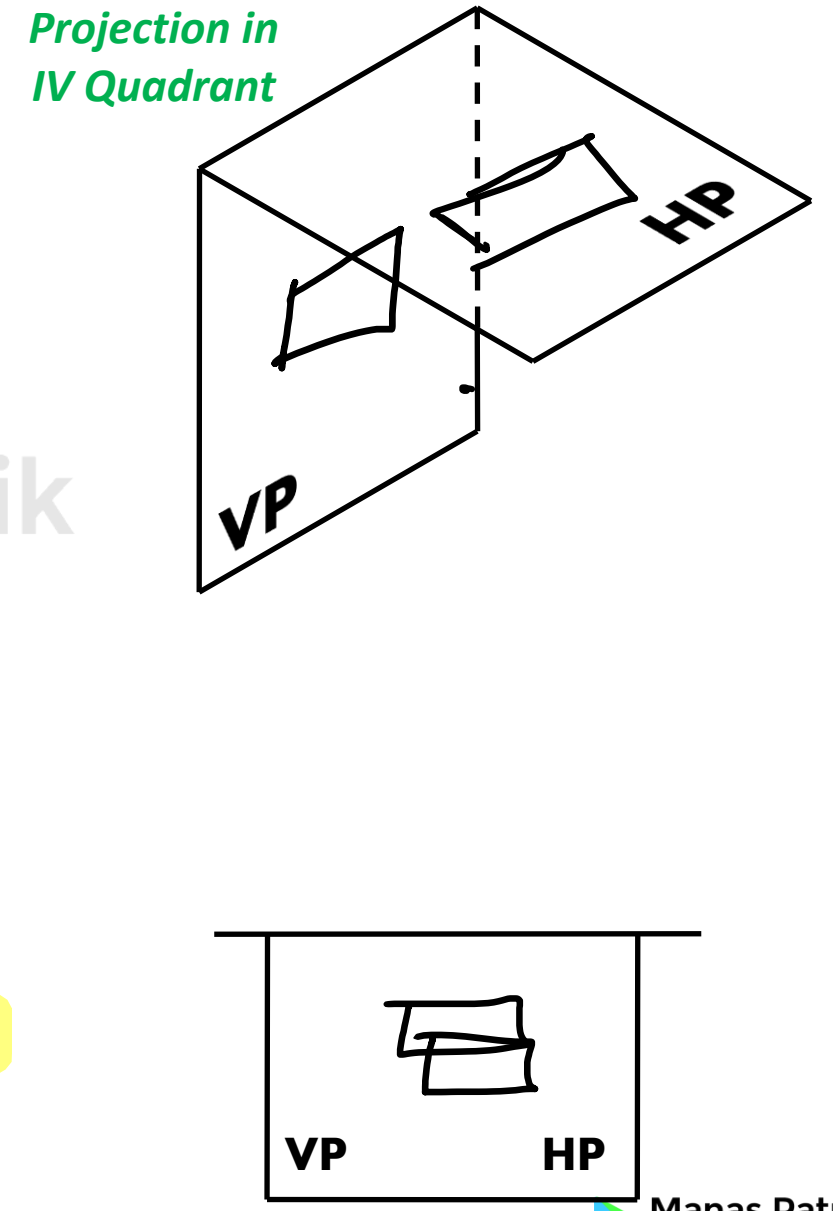
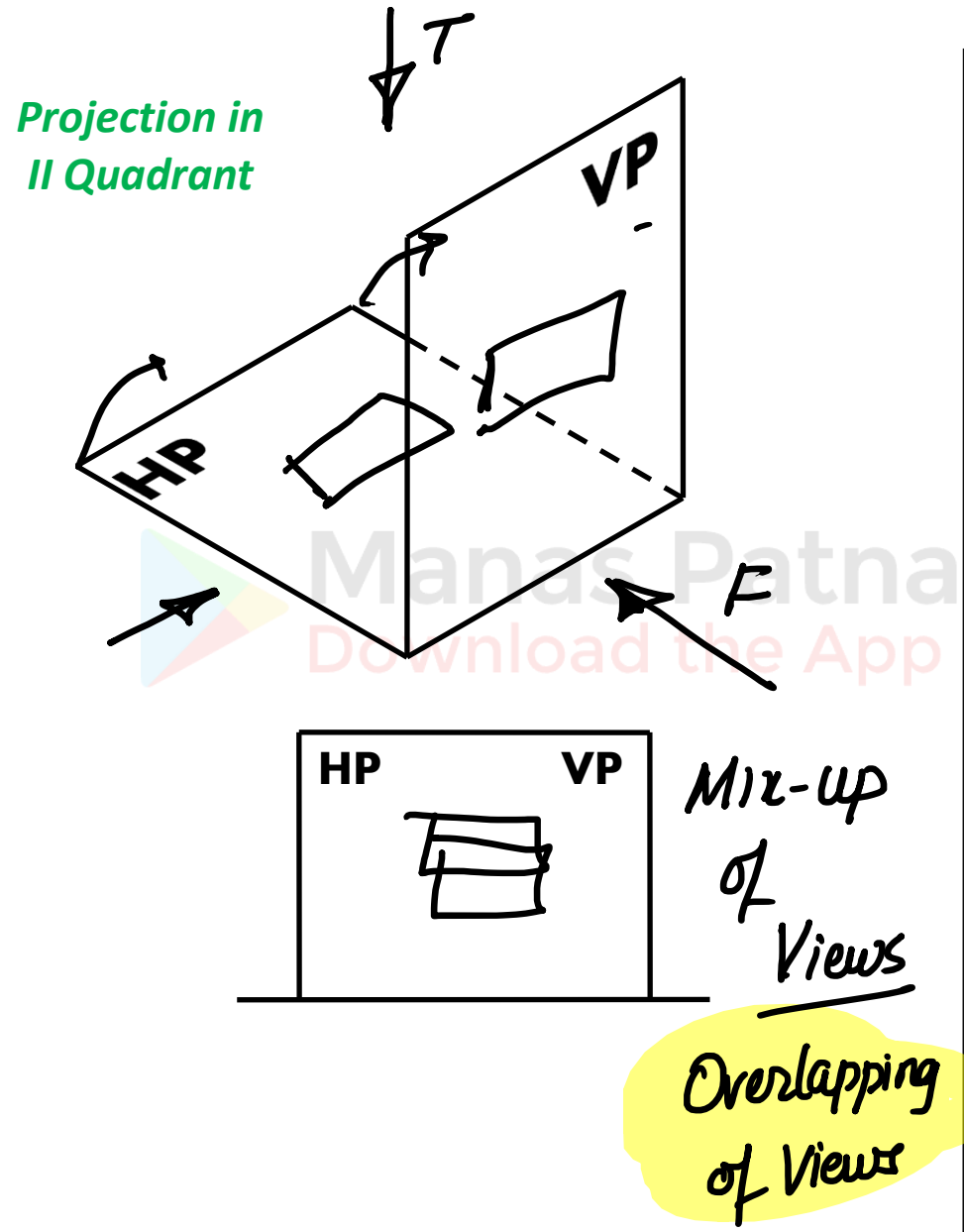
Transp
OBS — POP — OBJ
Third Angle Projection



7. Symbols of I and III Angle Projection



8. Why II and IV Quadrant is not advised for Projection ?

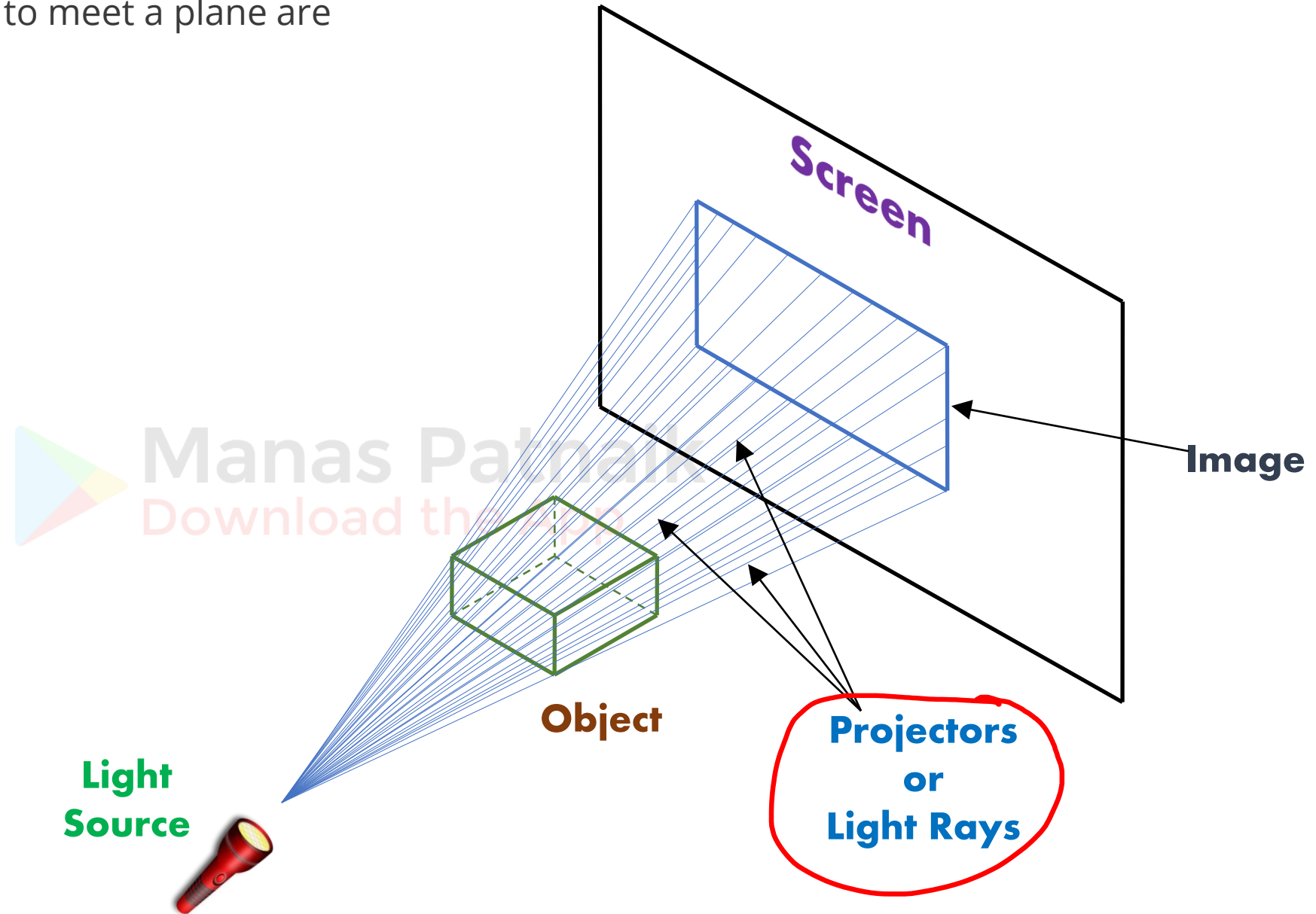


Chapter 6

Orthographic Projection – MCQ Type Problems

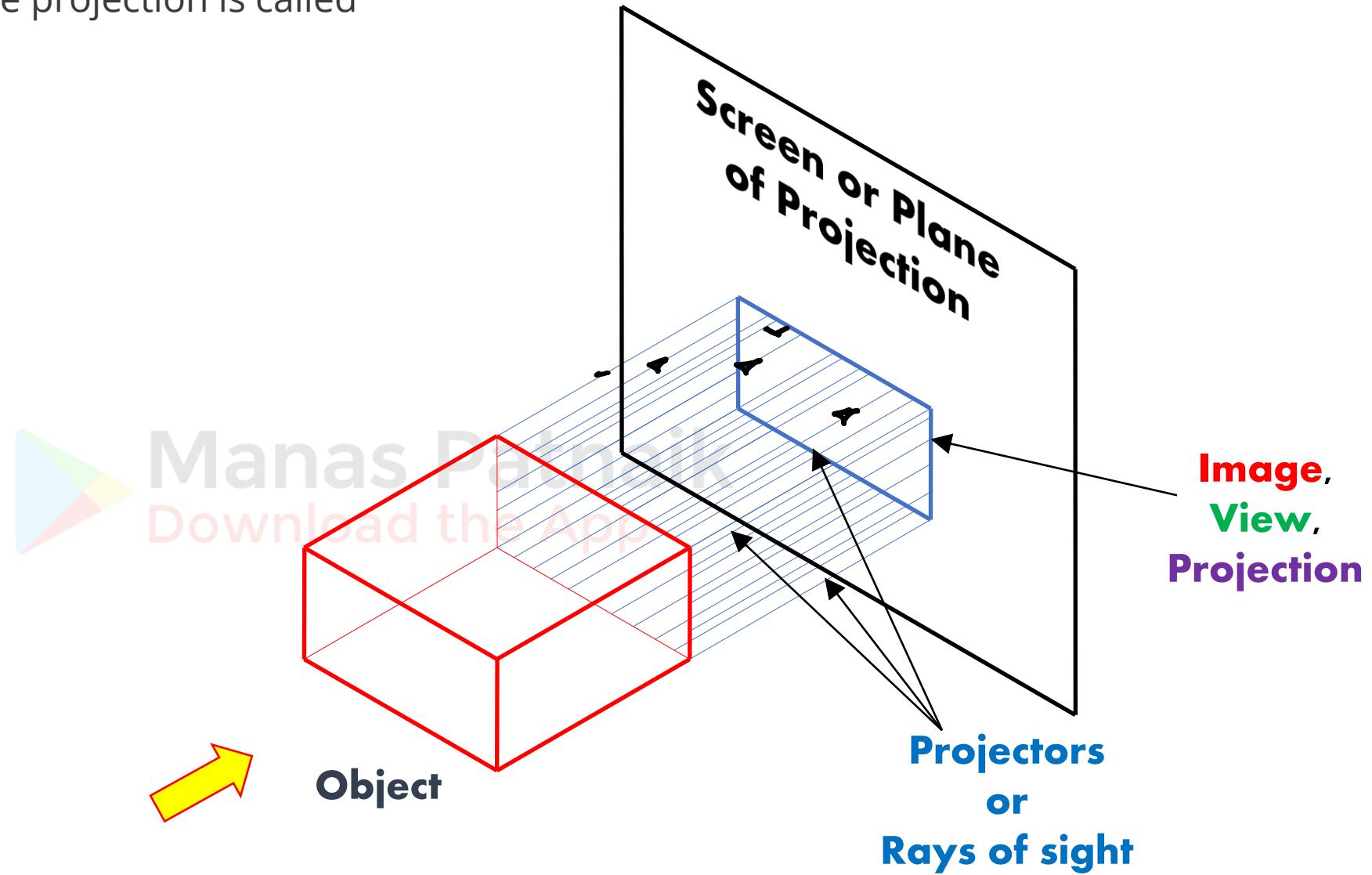
1. The straight lines which are drawn from various points on the contour of an object to meet a plane are called as _____

- a) connecting lines
- ~~b) projectors~~
- c) perpendicular lines
- d) hidden lines.



2. When the projectors are parallel to each other and also perpendicular to the plane, the projection is called

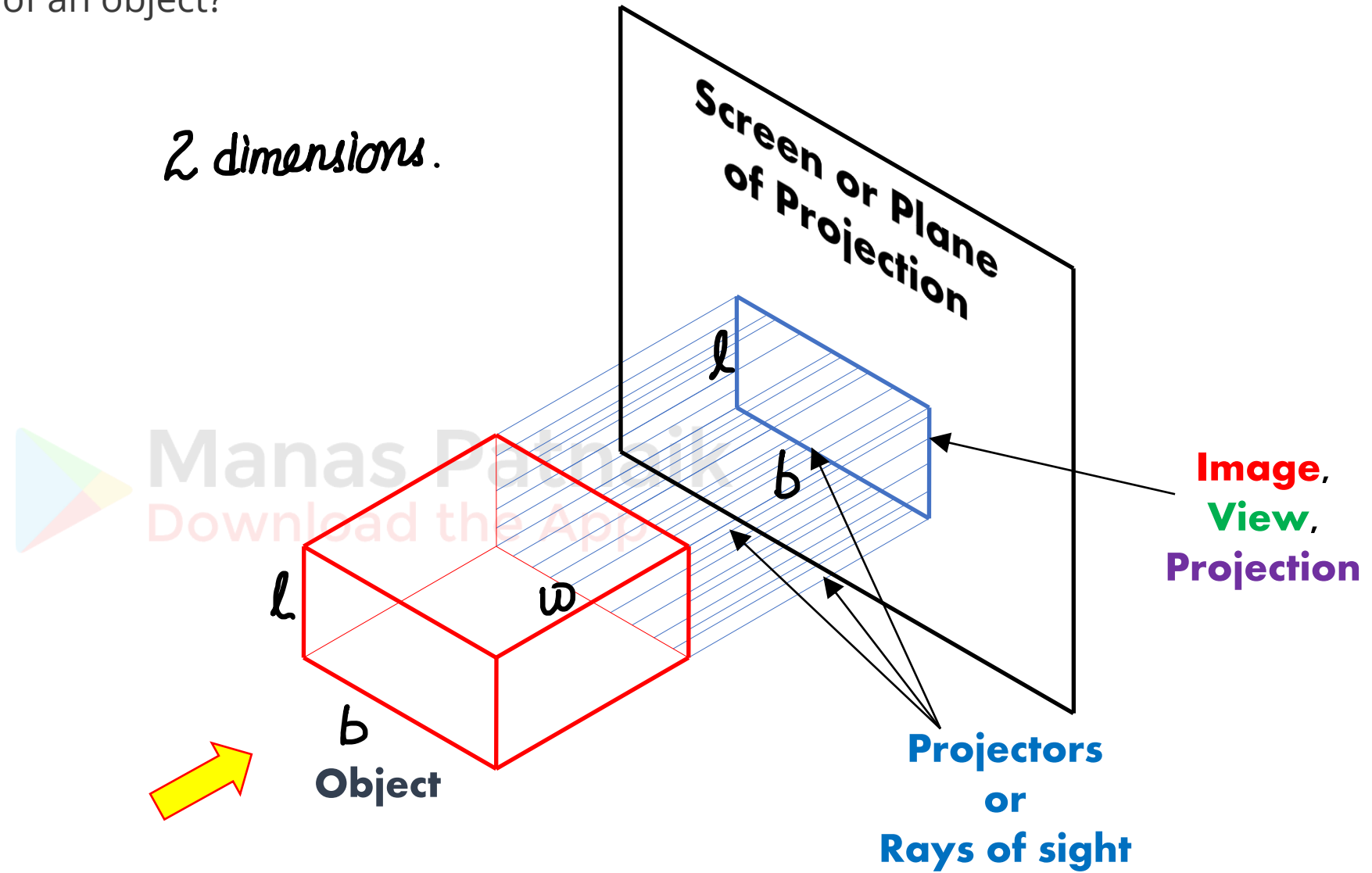
- a) Perspective projection
- b) Oblique projection
- c) Isometric projection
- d) ~~Orthographic projection~~



3. In orthographic projection, each projection view $\rightarrow FV, TV, LHSV$ represents how many dimensions of an object?

- a) 1
- ~~b) 2~~
- c) 3
- d) 0

2 dimensions.



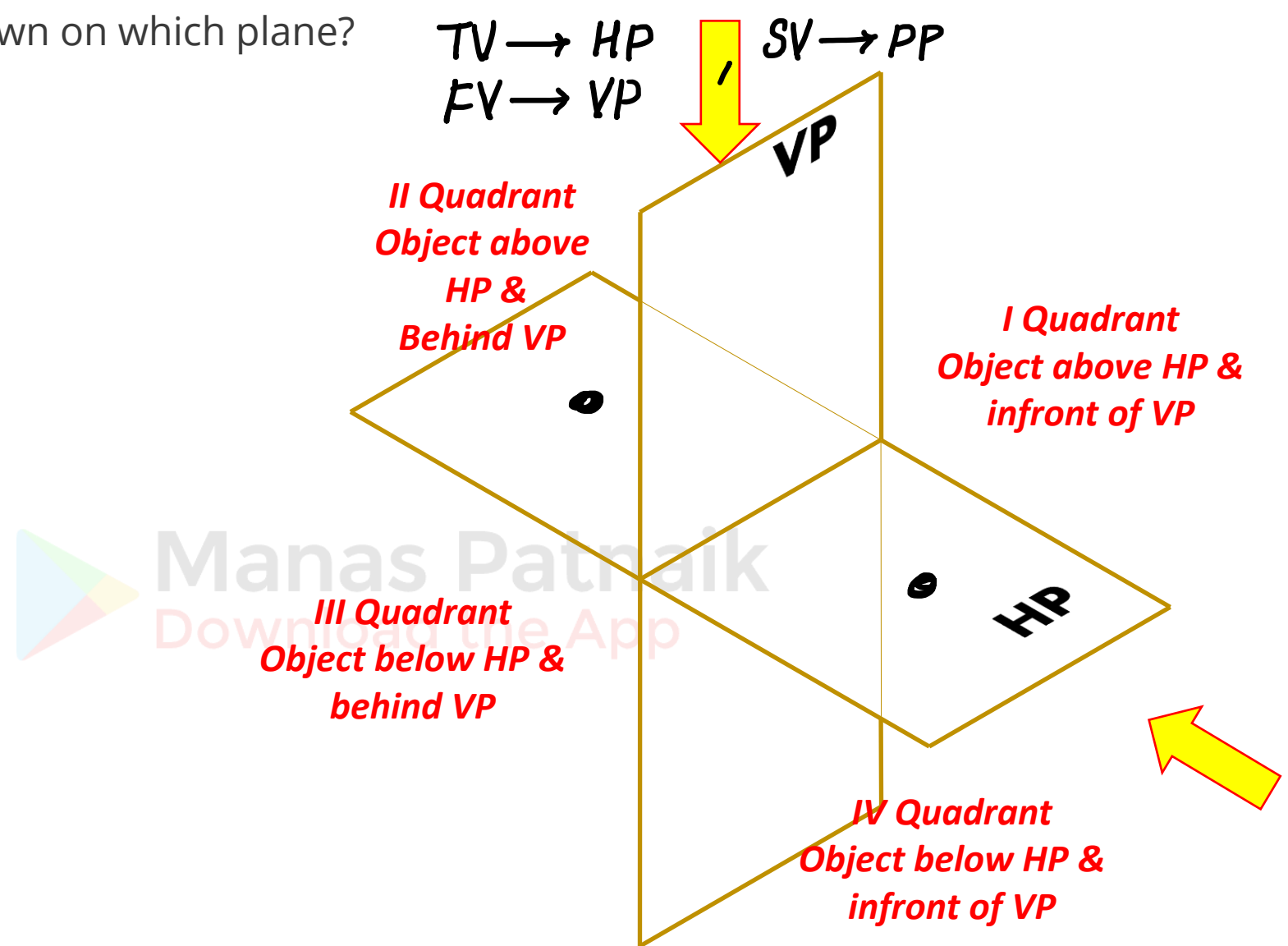
4. The hidden parts inside or back side of object while represented in orthographic projection are represented by which line?

- a) Continuous thick line
- b) Continuous thin line
- c) Dashed thin line
- d) Long-break line



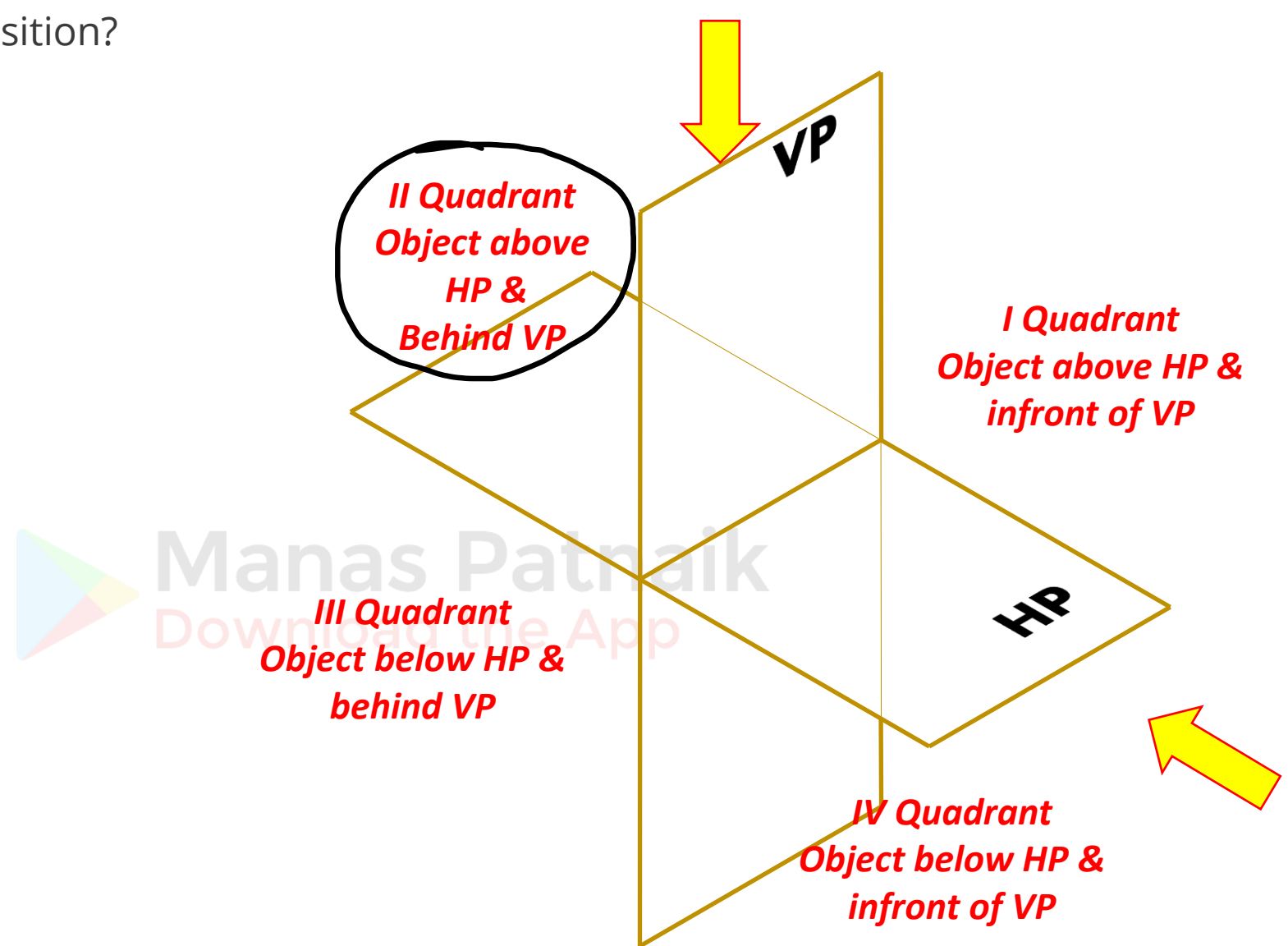
5. The Top view of an object is shown on which plane?

- a) Profile plane
- b) Vertical plane
- c) Horizontal plane
- d) Parallel plane



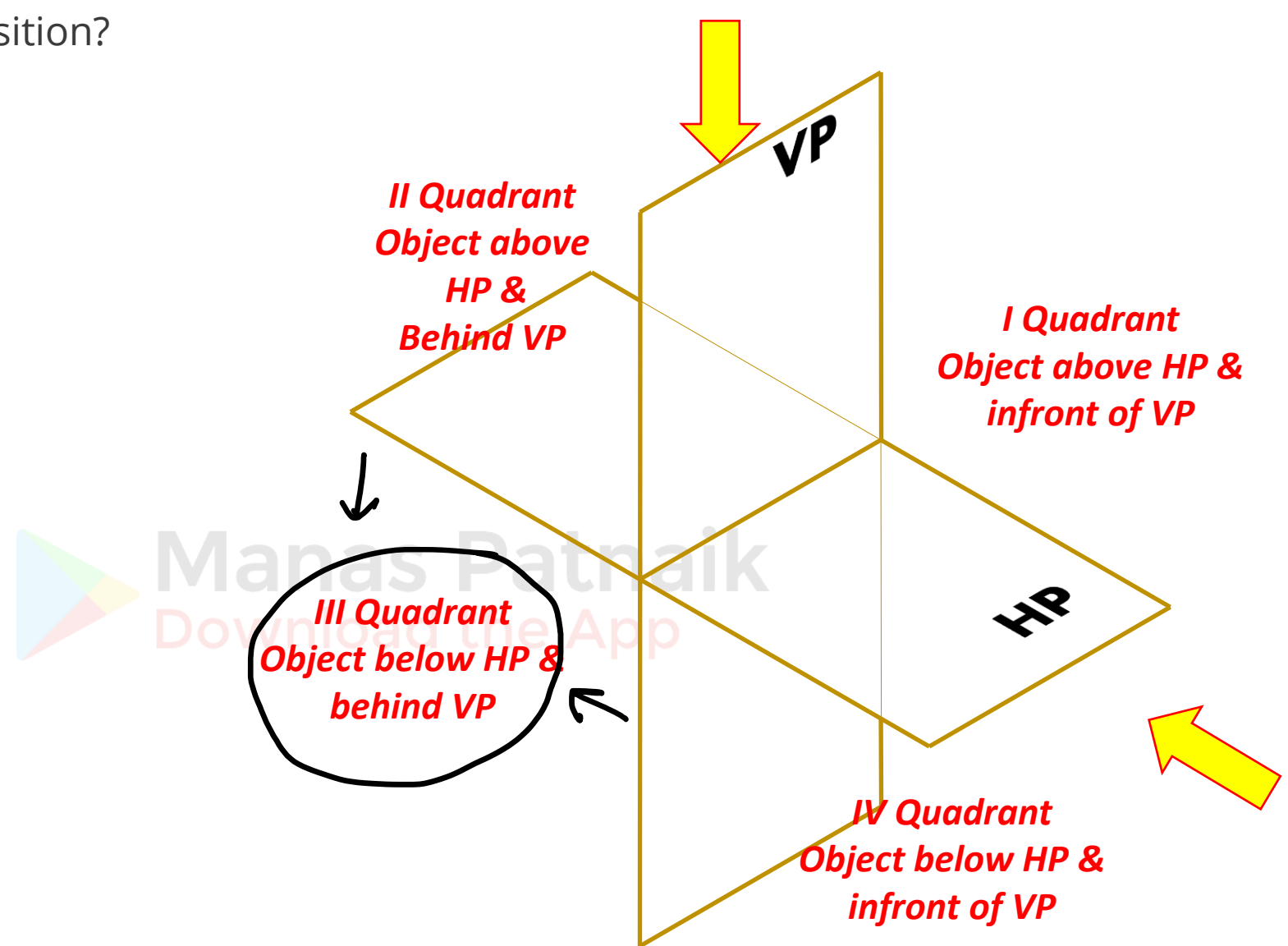
6. The 2nd quadrant is in which position?

- a) Below H.P, behind V.P
- b) Above H.P, behind V.P
- c) Above H.P, in-front of V.P
- d) Below H.P, in-front of V.P



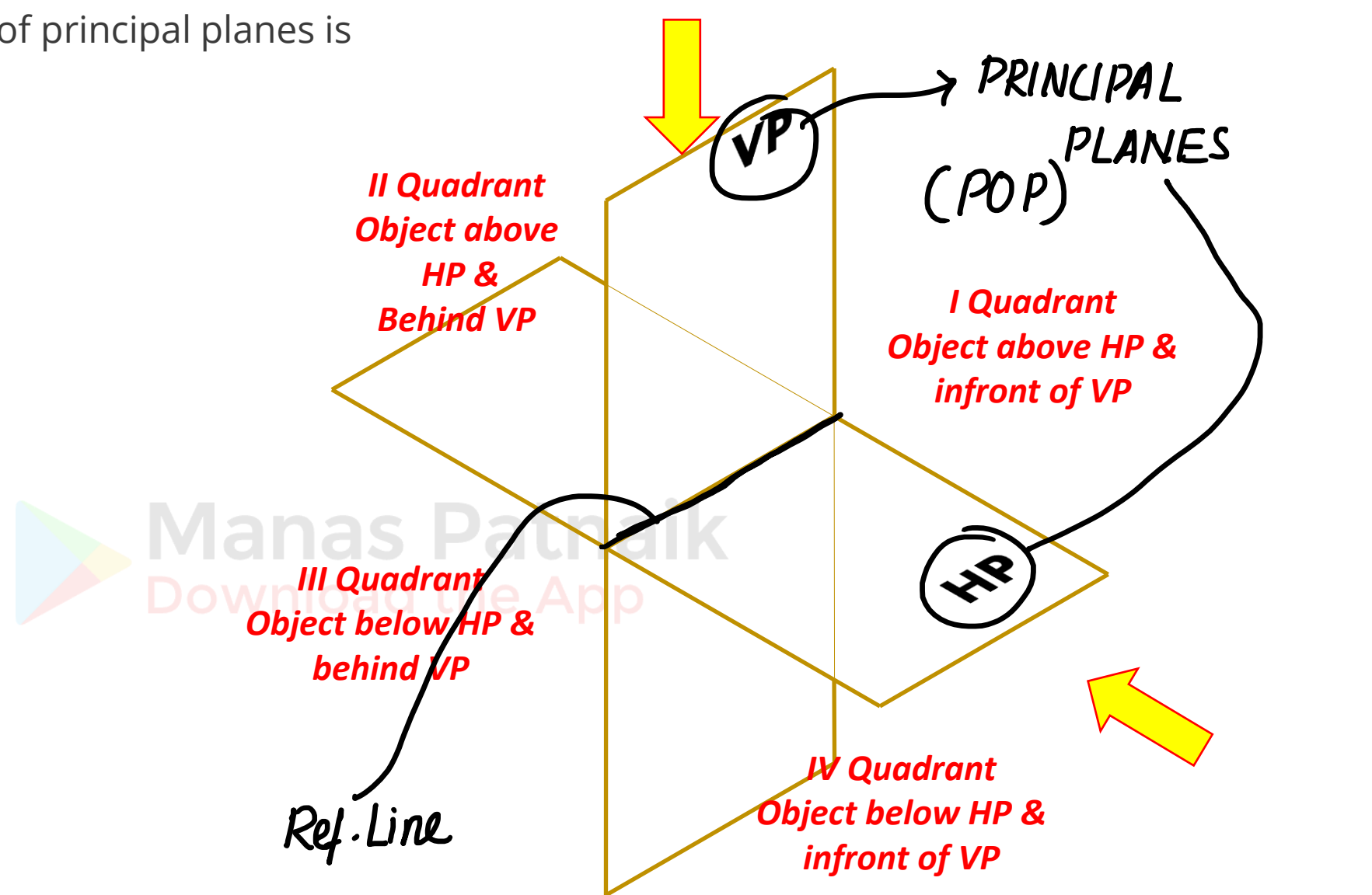
7. The 3rd quadrant is in which position?

- a) ~~Below H.P, behind V.P~~
- b) Above H.P, behind V.P
- c) Above H.P, in-front of V.P
- d) Below H.P, in-front of V.P



8. The line formed by intersection of principal planes is called _____

- a) projection line
- b) origin line
- c) line of intersection
- d) ✓ reference line



9. 1st angle projection is recommended by

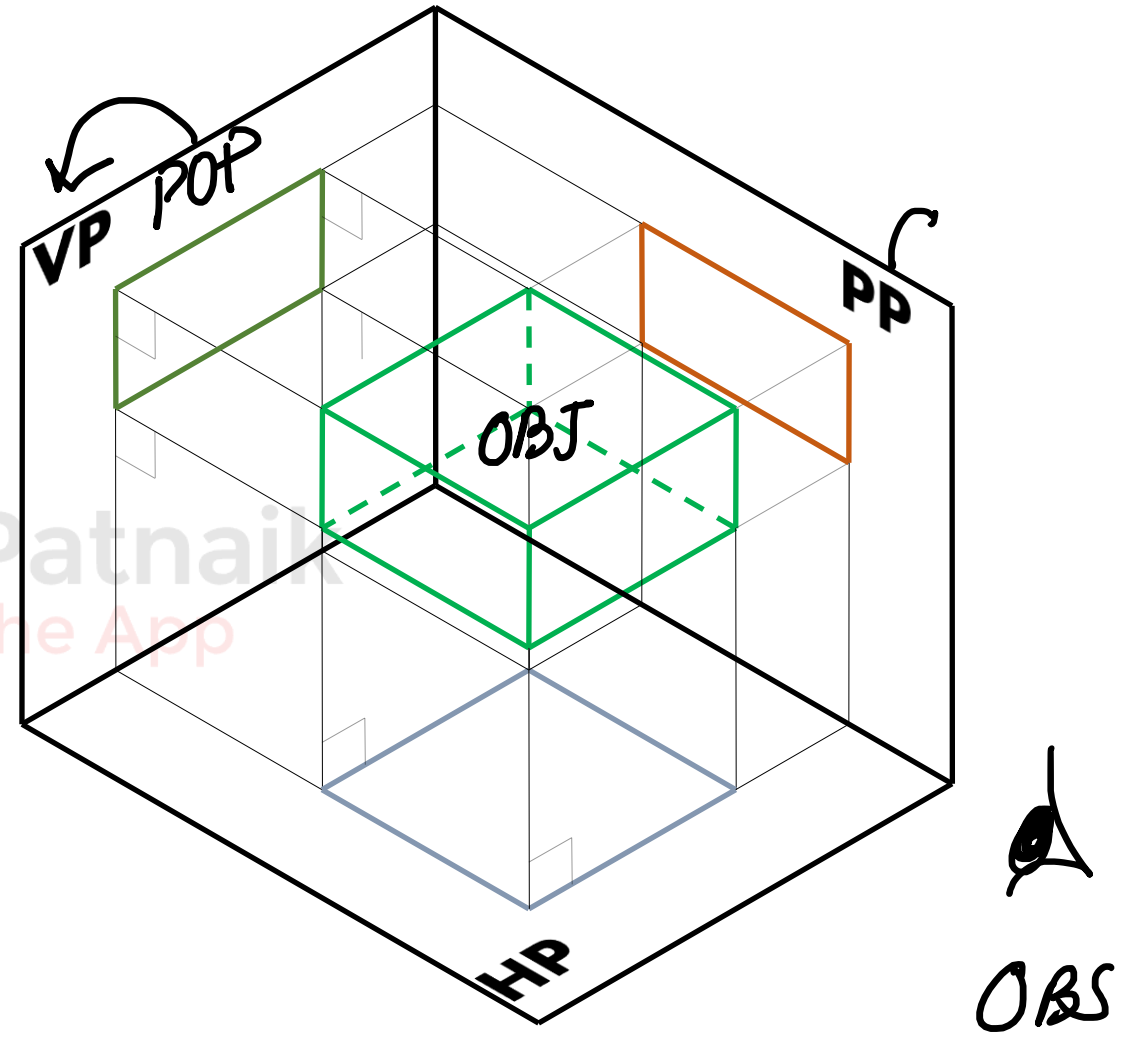
-
- a) USA
 - b) ISI
 - c) Bureau of Indian Standards
 - d) ASME



10. In 1st angle projection the OBJ lies between OBS and PP

- a) ~~object~~, projection plane, observer
- b) projection plane, object, observer
- c) reference line, side view, front view
- d) reference line, left side view, right side view

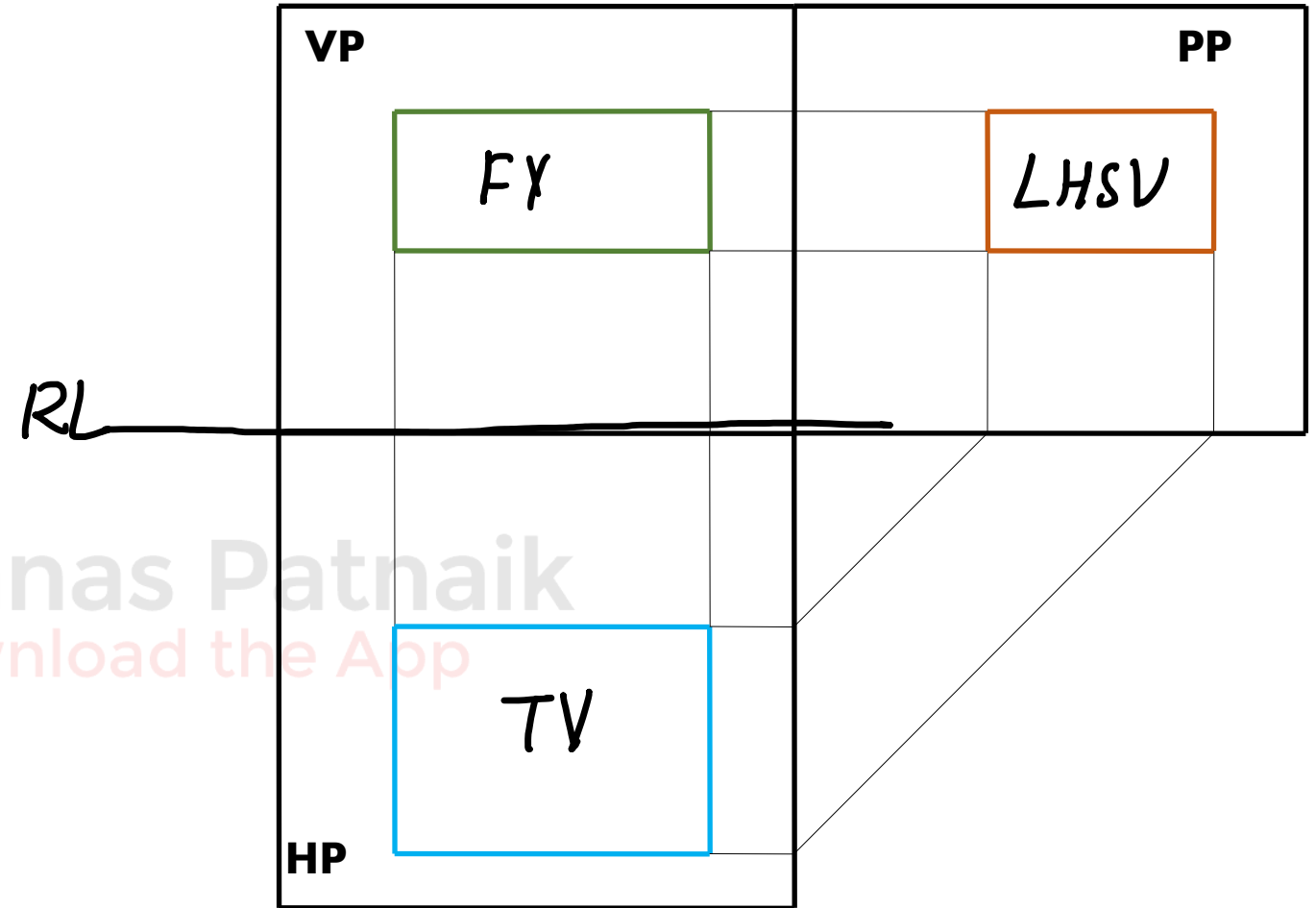
OBS — OBJ — POP



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11. The positions of reference line and top view in 1st angle projection are _____

- a) reference line lies above the top view
- b) reference line lies below the top view
- c) reference line lie left side to top view
- d) reference line lie right side to top view



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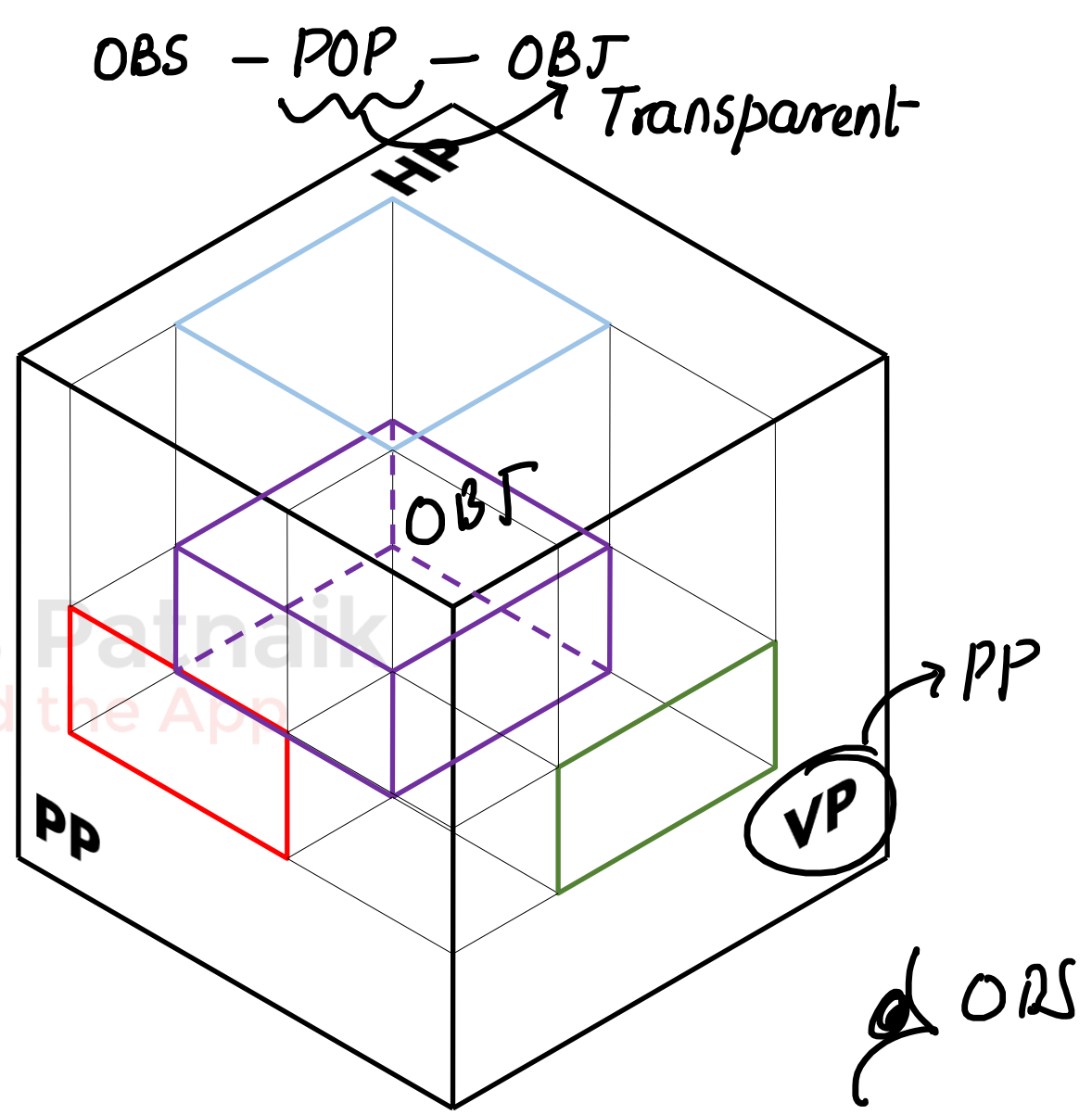
12. 3rd angle projection is recommended by

-
- a) ~~USA~~
 - b) ISI
 - c) Bureau of Indian Standards
 - d) IS



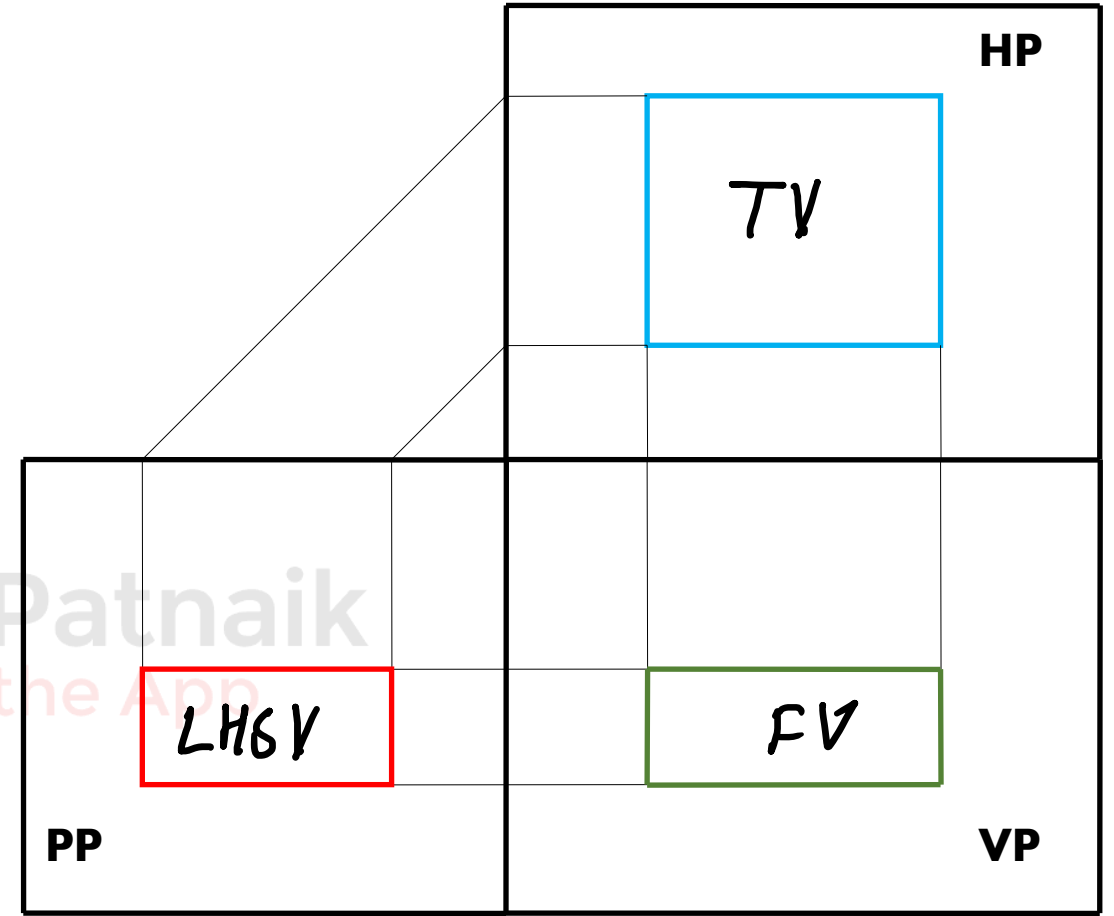
13. In 3rd angle projection the PP lies between _____ and _____

- a) object, projection plane, observer
- b) projection plane, object, observer
- c) reference line, side view, front view
- d) reference line, left side view, right side view



14. In 3rd angle projection, the positions of front view and top views are?

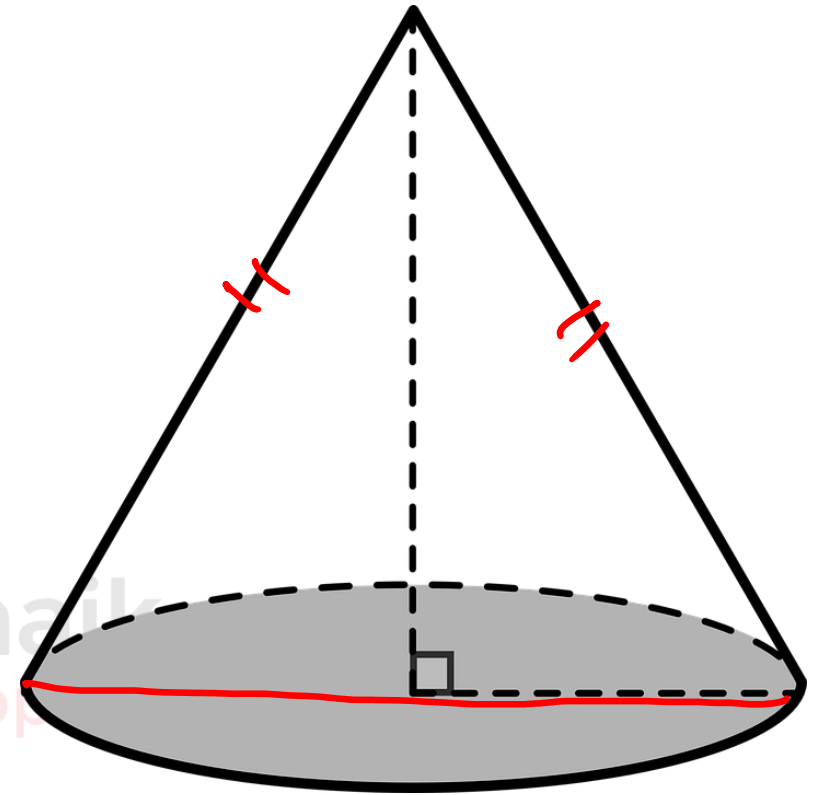
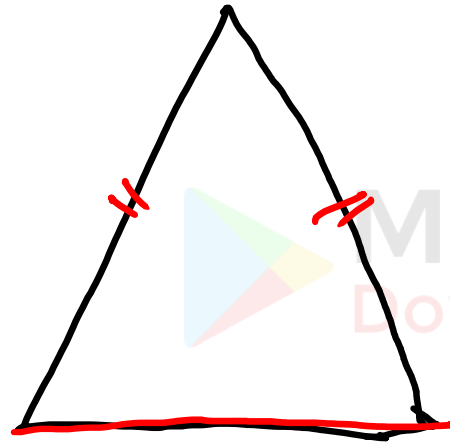
- a) ~~Top view lies above the front view~~
- b) Front view lies above the top view
- c) Front view lie left side to top view
- d) Top view lie left side to front view



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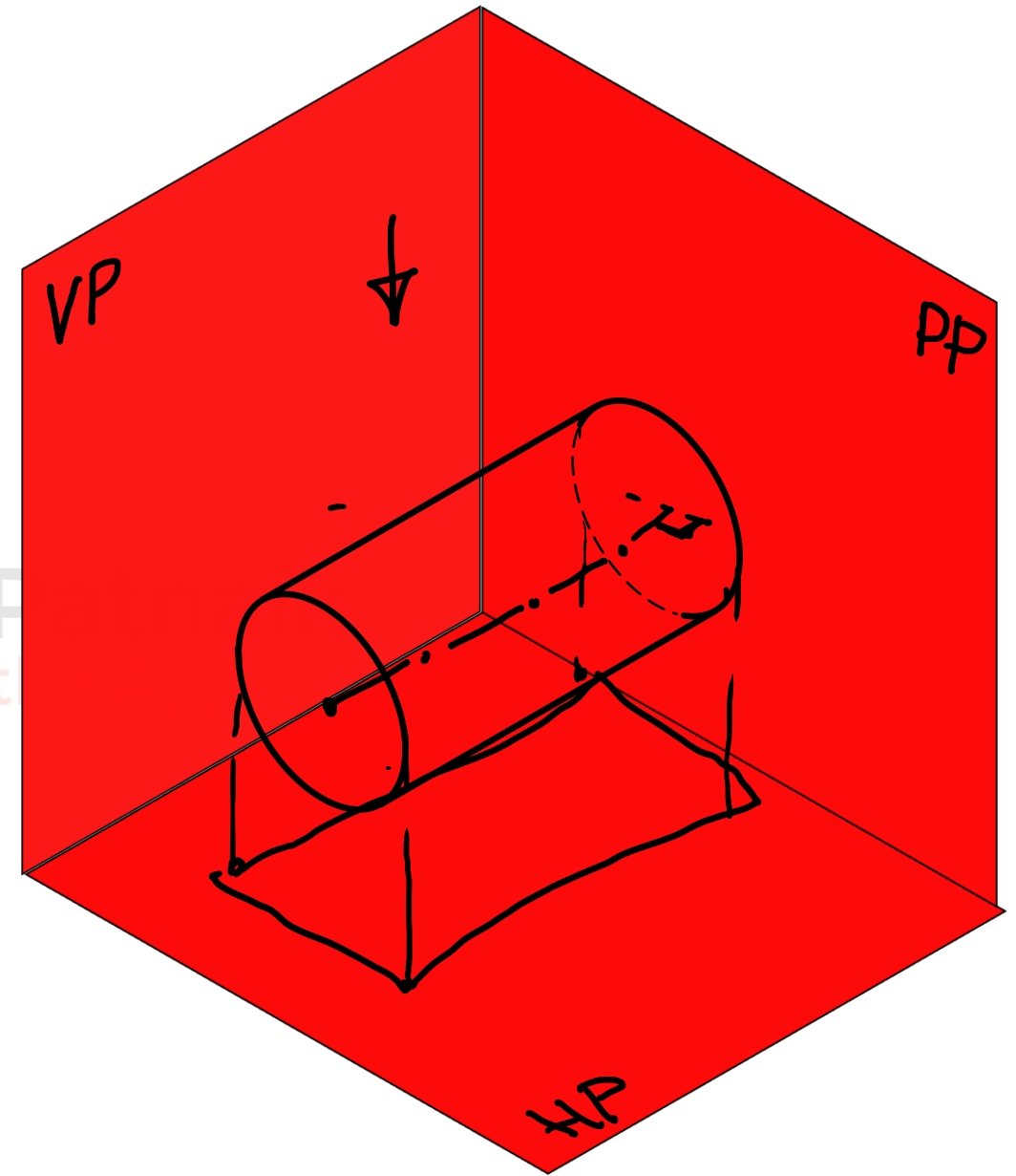
15. A regular cone is rested on base on horizontal plane
the front view will be _____

- a) circle
- b) scalene triangle
- c) equilateral triangle
- d) ~~isosceles triangle~~



16. A cylinder's axis is perpendicular to profile plane the top view will be _____

- a) circle
- b) cylinder
- c) rectangle
- d) parallelogram



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