

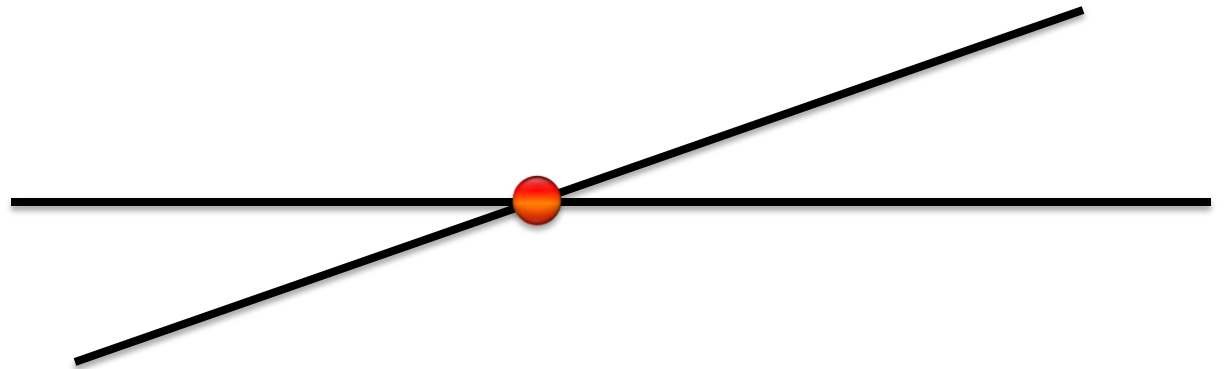
# UNIT II

## PROJECTION OF POINTS



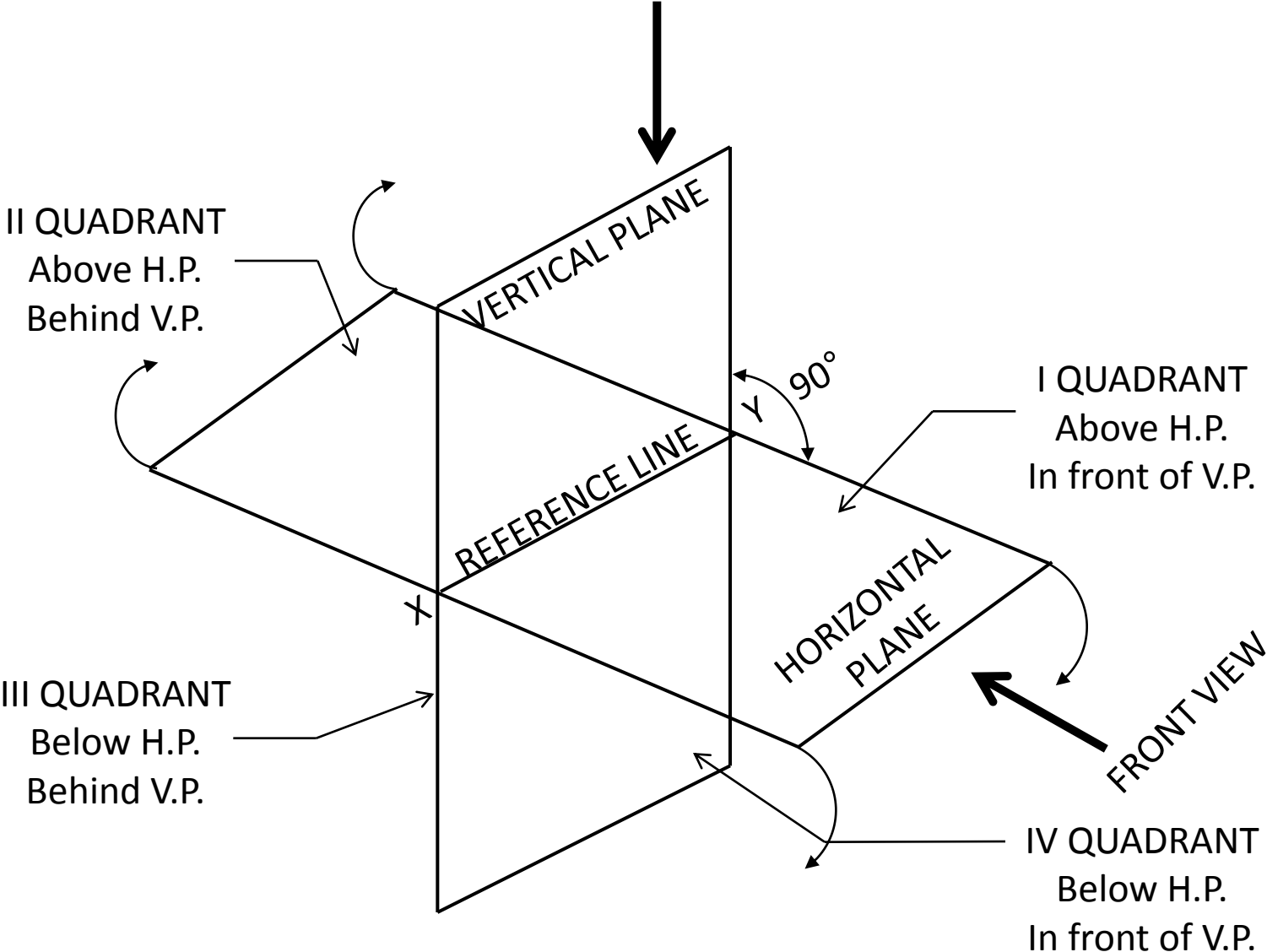
# Points

1. A point represents a location in space or on a drawing, and has **no width, height and depth**.
2. A point is represented by the **intersection of two lines**.



ALWAYS ROTATE H.P.  
CLOCKWISE TO OPEN-OUT  
I QUADRANT

TOP VIEW



# Positions of a point

1. When a point lies in the first quadrant, it will be above H.P. and in front of V.P.
2. When the point lies in the second quadrant, it will be above H.P. and behind V.P.
3. When the point lies in the third quadrant, it will be below H.P. and behind V.P.
4. When the point lies in the fourth quadrant, it will be in front of V.P. and below H.P.

# System of notation

1. In this text, the actual points in space are denoted by capital letters A, B, C etc.
2. Their **front views** are denoted by their corresponding lower case letters with dashes **a', b', c'** etc., and their **top views** by the lower case letters **a, b, c** etc.
3. Projectors are always drawn as continuous thin lines (2H pencil).

# Projection of a point in the first quadrant

Problem 1 :

Point A is 20 mm above H.P. and 30 mm in front of V.P. draw its front view and top view.

# Projection of a point in the first quadrant

Solution 1 :

1. The point A lies in the first quadrant.

2. To obtain the front view  $a'$ , look from the front :

Point A is 20 mm above H.P.  $Aa'$  is the projector perpendicular to V.P. Hence  $a'$  is the front view of the point A and it is 20 mm above the XY line.

# Projection of a point in the first quadrant

3. To obtain the top view  $a$ , look from the top:

Point  $A$  is 30 mm in front of V.P.  $Aa$  is the projector perpendicular to H.P. Hence  $a$  is the top view of the point  $A$  and it is 30 mm in front of  $XY$ .

4. To convert the projections  $a'$  and  $a$  obtained in the pictorial view into orthographic projections:

Rotate the H.P. about the  $XY$  line through  $90^\circ$  in the CW.



# Projection of a point in the first quadrant

4. To convert the projections  $a'$  and  $a$  obtained in the pictorial view into orthographic projections:

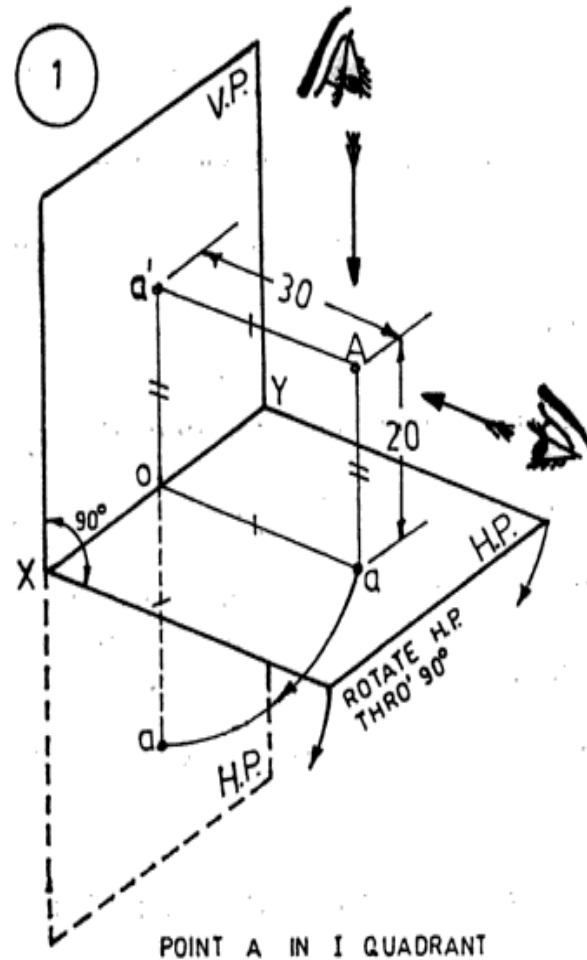
After rotation, the first quadrant is opened out and the H.P. occupies the position (dotted lines) vertically below the V.P. Also, the point  $a$  on H.P. will trace a quadrant of a circle with  $o$  as centre and  $oa$  as radius. Now  $a$  occupies the position just below  $o$ . Here the line joining  $a'$  and  $a$ , called the projector, is perpendicular to  $XY$ .

# Projection of a point in the first quadrant

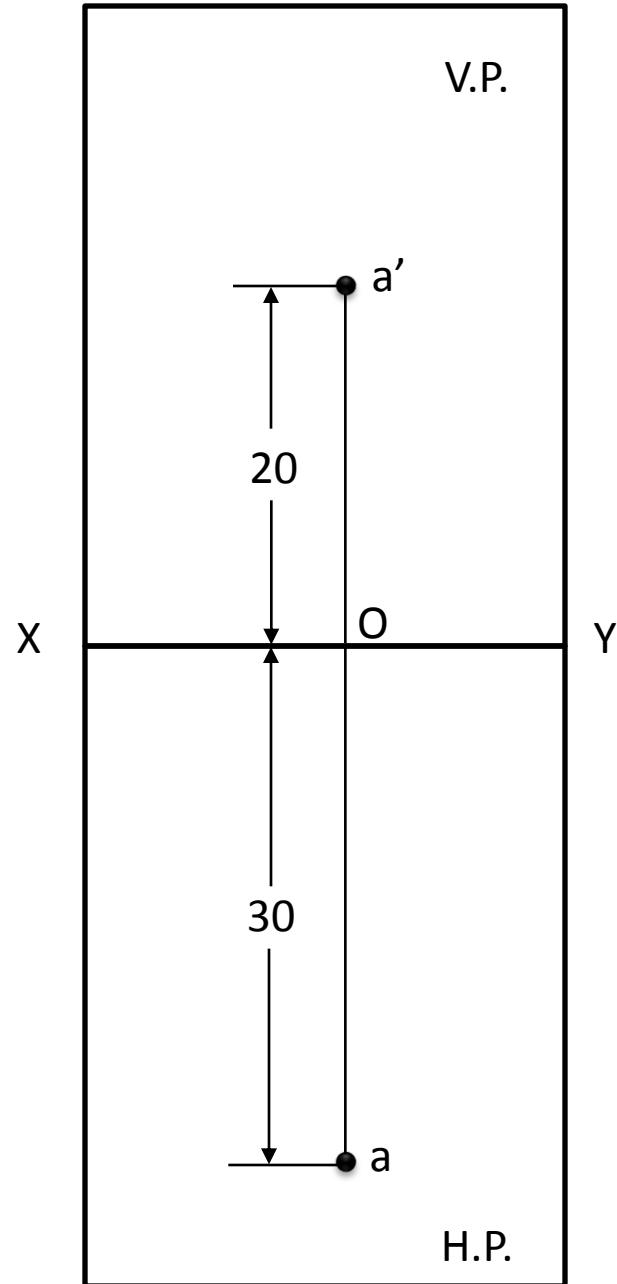
To draw the orthographic projections :

5. Front view : Draw the XY line and draw a projector at any point on it. Mark a' 20 mm above XY on the projector.
6. Top view : On the same projector. Mark a 30 mm below XY.

# Projection of a point in the first quadrant



# Projection of point in the first quadrant

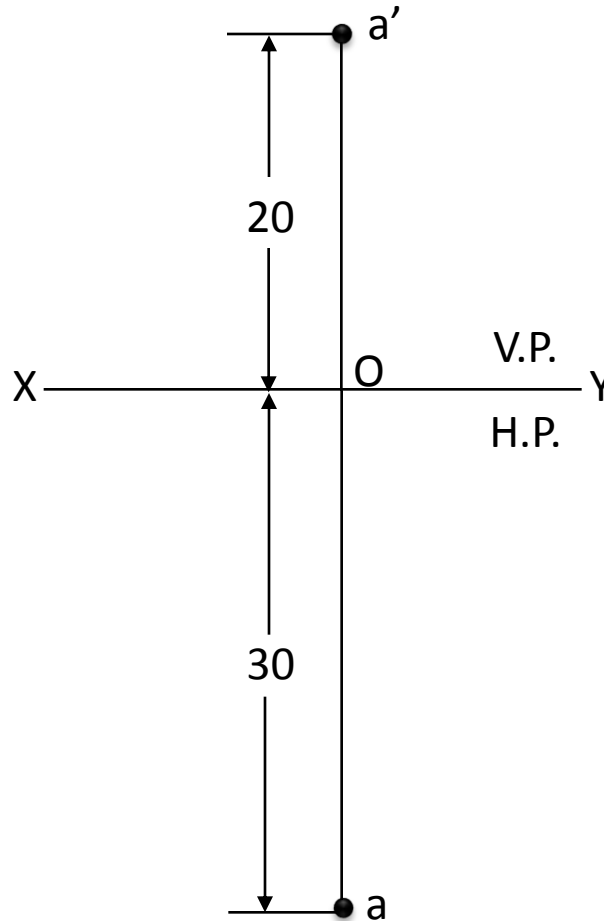


# Projection of point in the first quadrant Orthographic projection

$a'oa$  : Projector

$a'$  : View from front / Front View

$a$  : View from top / Top View



Point : H pencil (thick)

Lettering ( $a$ ,  $a'$ ) : HB pencil

Projector line ( $a'Oa$ ) : 2H pencil (thin line)

# Projection of a point in the first quadrant

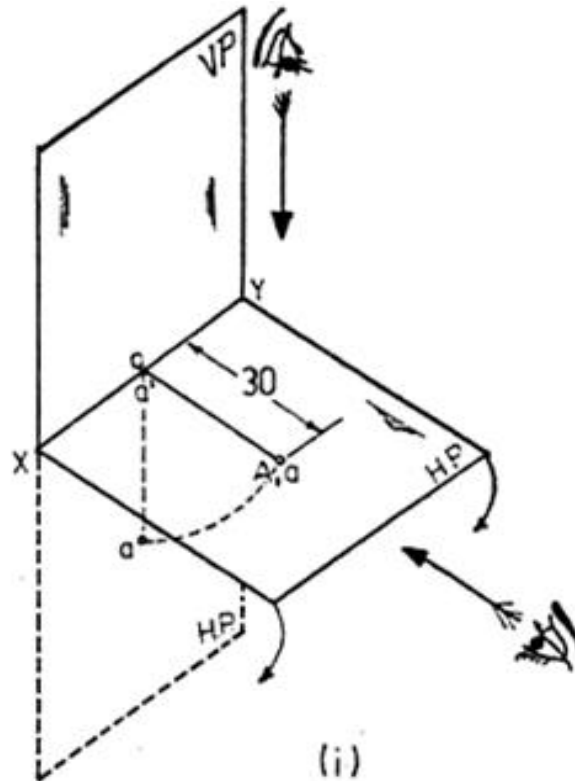
Problem 2 :

A Point M is 35 mm above H.P. and 45 mm in front of V.P. Draw its projections.

# Projection of a point in the first quadrant

Problem 3 :

Draw the projections of a point A lying on H.P. and 30 mm in front of V.P. Draw its projections.

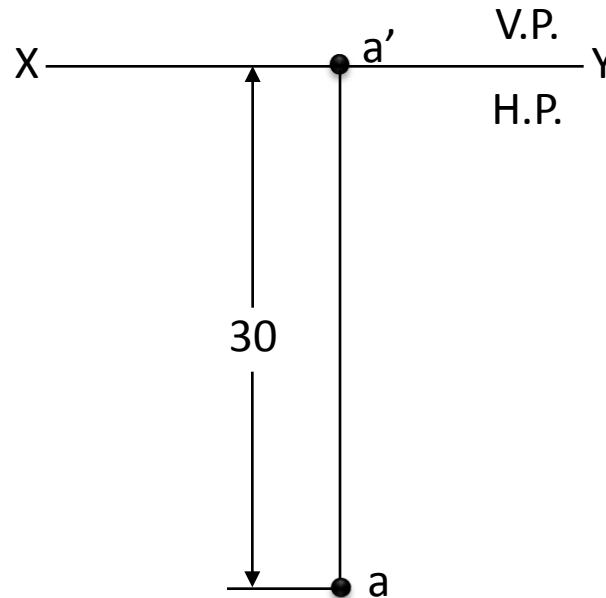


# Projection of point in the first quadrant Orthographic projection

$a'o_a$  : Projector

$a'$  : View from front / Front View

$a$  : View from top / Top View



Point : H pencil (thick)

Lettering ( $a$ ,  $a'$ ) : HB pencil

Projector line ( $a'o_a$ ) : 2H pencil (thin line)



# Projection of a point in the first quadrant

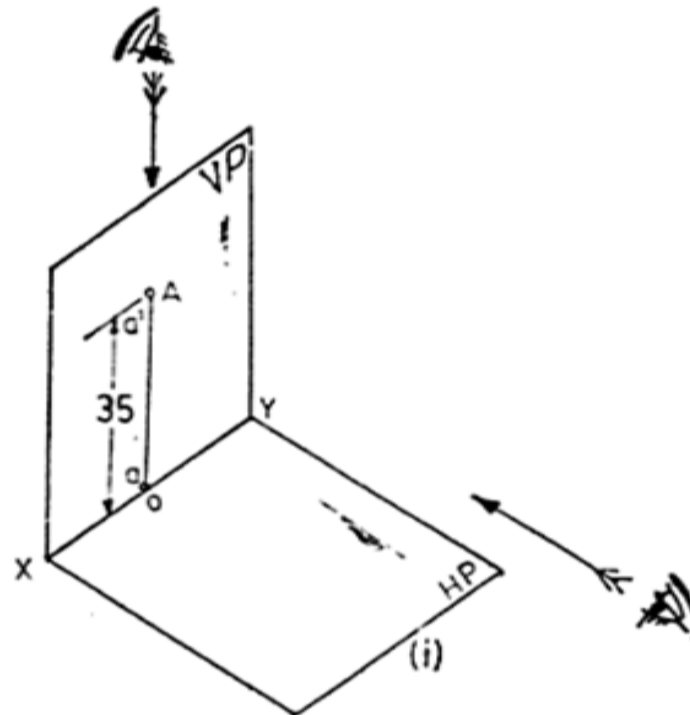
Problem 4 :

Draw the projections of a point B lying on H.P. and 40 mm in front of V.P. Draw its projections.

# Projection of a point in the first quadrant

Problem 5 :

Draw the projections of a point A lying on V.P. and 35 mm above H.P. Draw its projections.



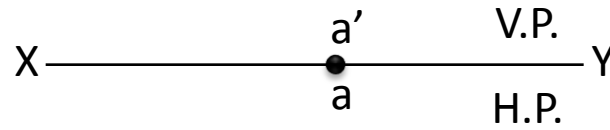
# Projection of a point in the first quadrant

Problem 6 :

Draw the projections of a point F which lies in both the H.P. and V.P. Draw its projections.

# Projection of point in the first quadrant

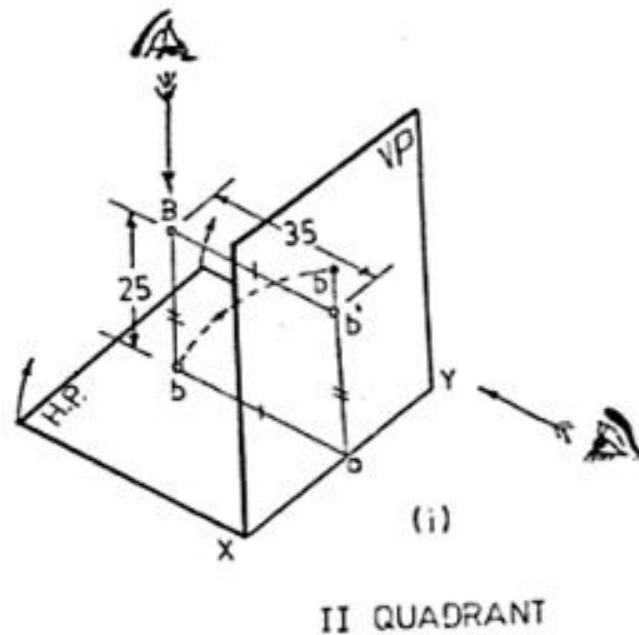
## Orthographic projection



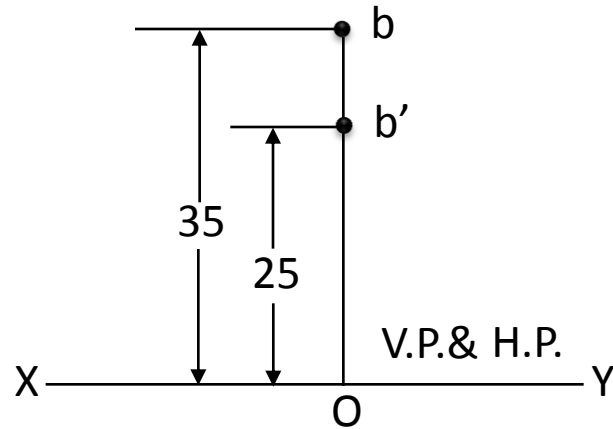
# Projection of a point in the **second quadrant**

Problem 7 :

A point B is 25 mm above H.P. and 35 mm behind V.P. Draw its projections.



# Projection of point in the second quadrant Orthographic projection



# Projection of a point in the second quadrant

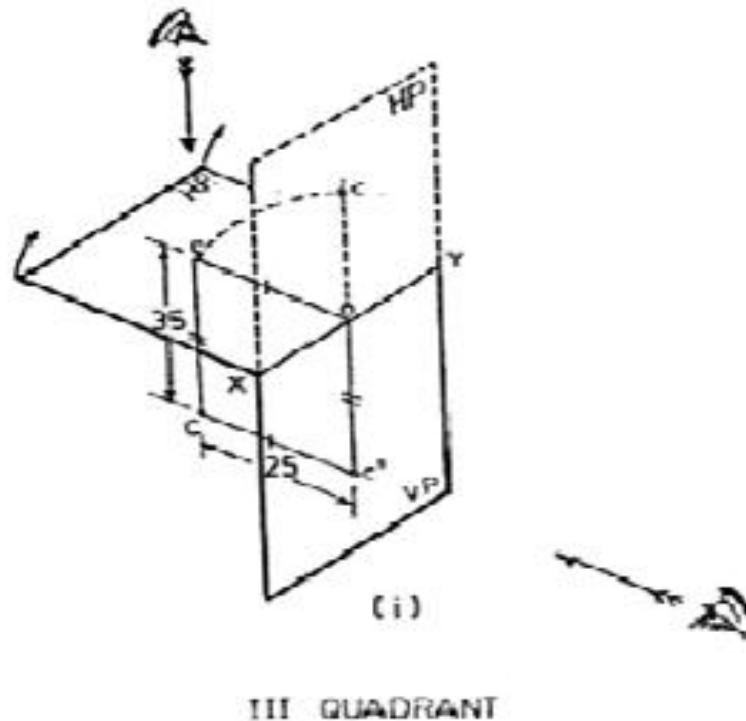
Problem 8 :

A point S is 35 mm above H.P. and 50 mm behind V.P. Draw its projections

# Projection of a point in the **third quadrant**

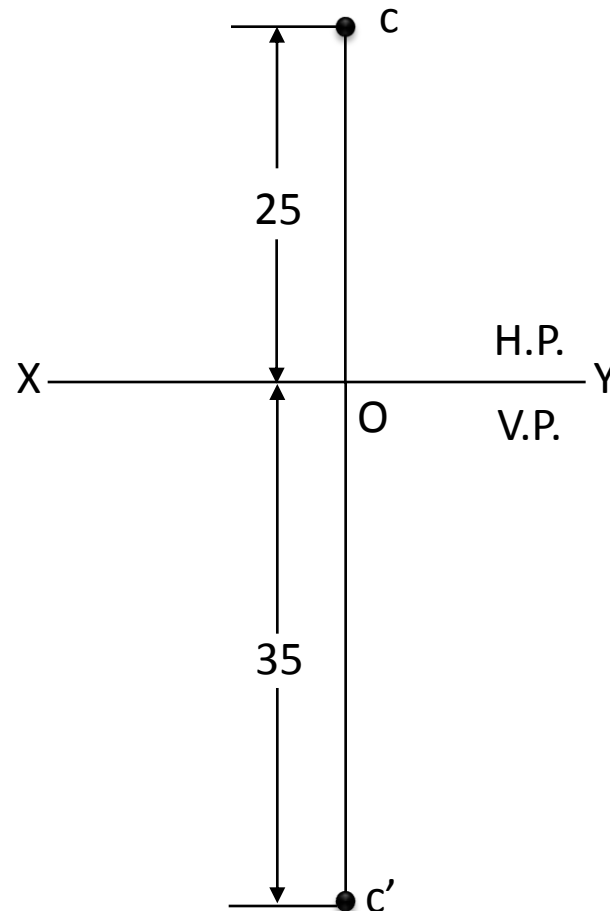
Problem 9 :

A point C is 35 mm below H.P. and 25 mm behind V.P. Draw its projections.





# Projection of point in the third quadrant Orthographic projection



# Projection of a point in the third quadrant

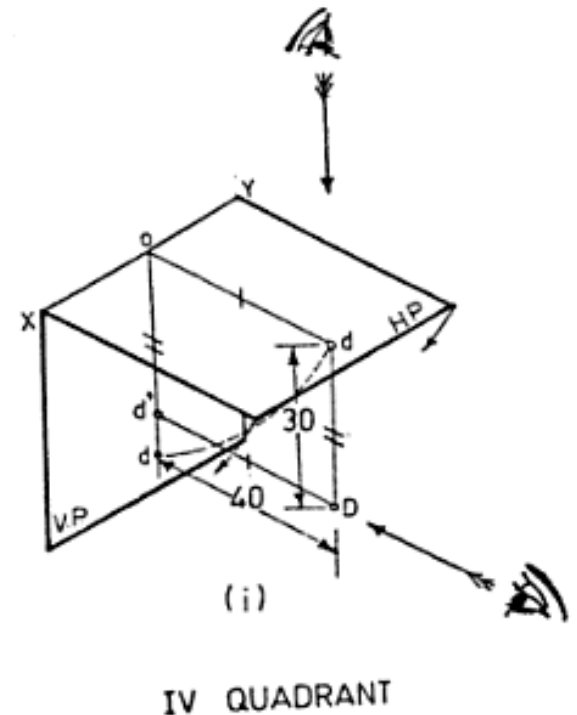
Problem 10 :

A point D is 45 mm below H.P. and 55 mm behind V.P. Draw its projections.

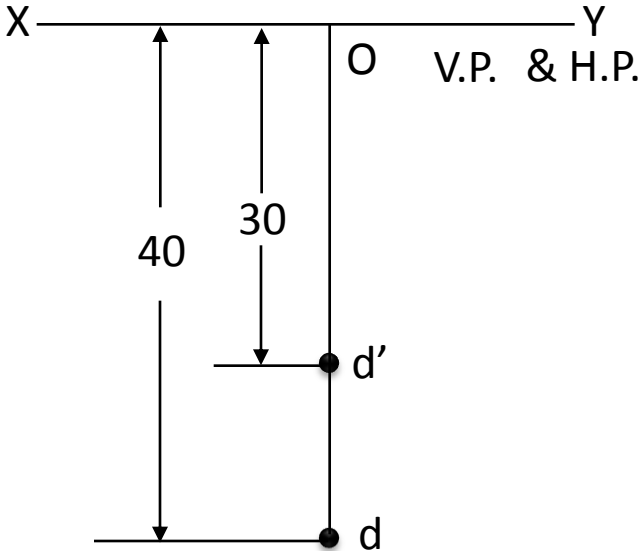
# Projection of a point in the **fourth quadrant**

Problem 11 :

A point D is 30 mm below H.P. and 40 mm in front of V.P. Draw its projections.



# Projection of point in the fourth quadrant Orthographic projection

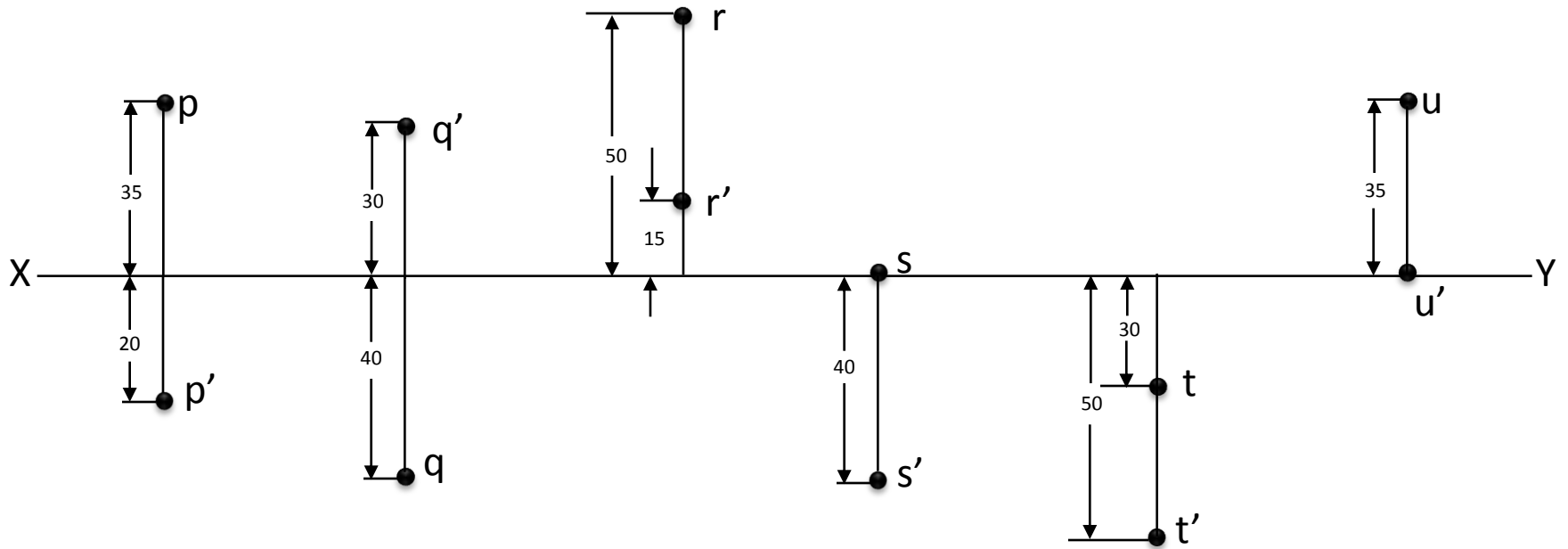


# Problem 12

Mark the projections of the following points on a common reference line :

- a) P, 35 mm behind the V.P. and 20 mm below the H.P.
- b) Q, 40 mm in front of the V.P. and 30 mm above the H.P.
- c) R, 50 mm behind the V.P. and 15 mm above the H.P.
- d) S, 40 mm below the H.P. and in the V.P.
- e) T, 30 mm in front of V.P. and 50 mm below the H.P.
- f) U, 35 mm behind the V.P. and in the H.P.

# Problem 12



# Problem 13

Mark the projections of the following points on a common reference line :

1. P, 25 mm below the H.P. and in the V.P.
2. Q, 40 mm behind the V.P. and in the H.P.
3. R, 30 mm below the H.P. and 30 mm in front of the V.P.
4. S, 25 mm above the H.P. and 25 mm behind the V.P.
5. T, 25 mm above the H.P. and 30 mm in front of the V.P.
6. U, in both the V.P. and the H.P.

# Summary

<b>Sl.No</b>	<b>Location of Point</b>	<b>Front View</b>	<b>Top View</b>	<b>Quadrant</b>
1.	Above H.P. & In front of V.P.	Above XY	Below XY	First
2.	Above H.P. & Behind V.P.	Above XY	Above XY	Second
3.	Below H.P. & Behind V.P.	Below XY	Above XY	Third
4.	Below H.P. & In front of V.P.	Below XY	Below XY	Fourth
5.	Above H.P. On V.P.	Above XY	On XY	First or Second
6.	Below H.P. On V.P.	Below XY	On XY	Third or Fourth
7.	On H.P. In Front of V.P.	On XY	Below XY	First or Fourth
8.	On H.P. Behind V.P.	On XY	Above XY	Second or Third