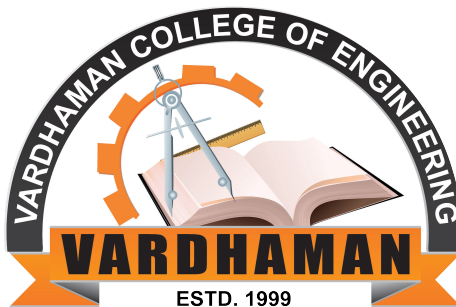# COMPUTER AIDED DRAWING

A-8302

Experiment No. 3

Projection of Points - I

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Group Name

I B.Tech II Semester

Computer Science Engineering

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Projection of Points I

1 Objectives

→ explain how to transform points from one coordinate system to another

→ Understand the concept of orthogonal projections

→ Develop a geometric intuition for projections

→ Develop the ability to choose the appropriate projection method for specific problems.

2 Introduction

A point represents a location in space. It is a dimensionless geometrical entity which has simply position but no magnitude. A point is obtained wherever two straight or curved lines intersect each other. A point is also obtained at the intersection of three mutually inclined or perpendicular planes. A point is usually represented by a dot or a very small circle.

In fact, projections of points have no practical significance. However, it serves the basis for projections of lines, projections of planes and projections of solids. Hence, one must go through this topic very carefully as the subsequent experiments are based on it.

2.1 Location of Point

The orthographic projections are obtained on two principal planes (also known as reference planes) having negligible thickness, namely vertical plane (V.P.) and horizontal plane (H.P.) as shown in Fig. (a) and (b).The principal planes are perpendicular to each other and divide the space into four quadrants. A point lying in the space can be defined in one of the following positions with respect to the principal planes.

(a)   (b)
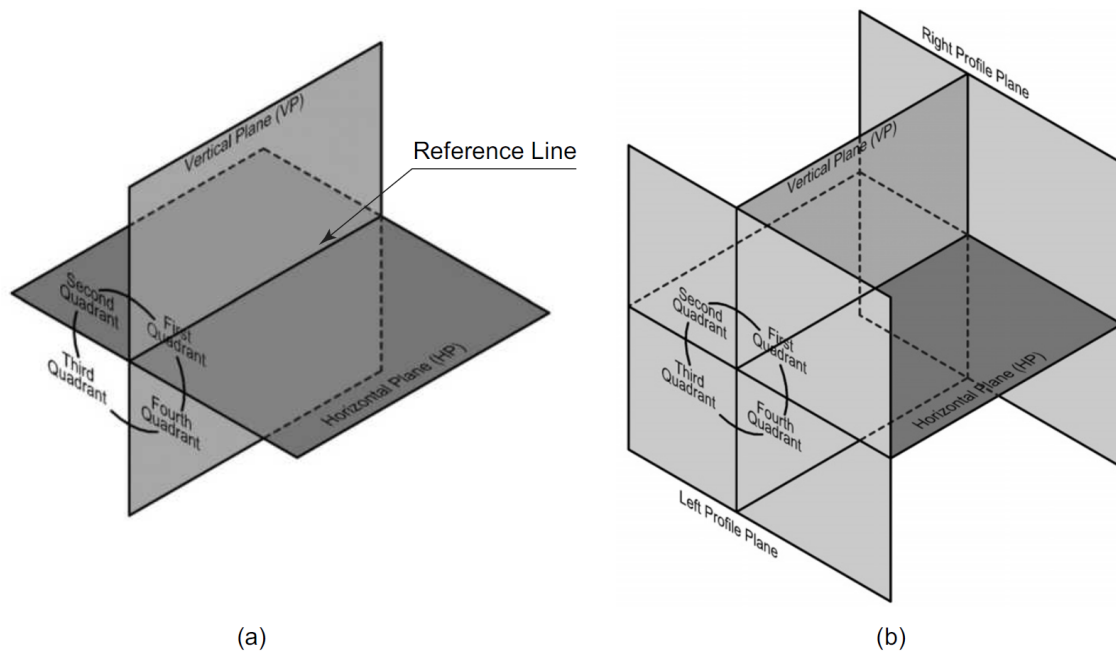
Point may be

     i. Above the H.P. and in front of the V.P.

    ii. Above the H.P. and behind the V.P.

  iii. Below the H.P. and behind the V.P.

  iv. Below the H.P. and in front of the V.P.

    v. On the H.P. and in front of the V.P.

  vi. Above the H.P. and on the V.P.

 vii. On the H.P. and behind the V.P.

viii. Below the H.P. and on the V.P.

  ix. On both the H.P. and the V.P.

3 Aim

Perform the following in AUTOCAD

- *Draw the front and the top views of a point A, lying 50 mm above the H.P. and 30 mm in front of the V.P. Also draw the side view.*

- *Draw the projections of a point B, lying 50 mm above the H.P. and 30 mm behind the V.P.*

- *Draw the projections of a point C, lying 50 mm below the H.P. and 30 mm behind the V.P.*

- *Draw the projections of a point D, lying 50 mm below the H.P. and 30 mm in front of the V.P.*

4 Software Used

- AUTOCAD

5 System Requirements

(a) **System Type:** Windows 10 64 Bit Operating System

(b) **Processor:** i3

(c) **RAM:** 4 GB

6 Commands Used

(a) Units

(b) Ucsicon

(c) Limits

(d) Line

(e) Donut

(f) Text

(g) Arc

(h) Trim

(i) Erase

(j) Move

(k) Dimension Linear

7 Experimental procedure

(a) Open the file with name *Template.dwg* and edit the title block.

(b) Perform the units and ucsicon commands.

(c) In the limits set the A4 sheet dimensions $297x210$.

(d)

(e)

(f)

(g)

(h)

(i)

(j)

(k)

(l)

(m)

(n)

(o)

8   Result

The solutions of the projection of points are analysed and drawn in the AUTOCAD.

9   Outcomes

→ evaluate the projection of point in the first quadrant

→ distinguish how the veiws are merging in the second quadrant

→ compare the views of first and third angle projection

→ Develop the layout of the drawing sheet in CAD.
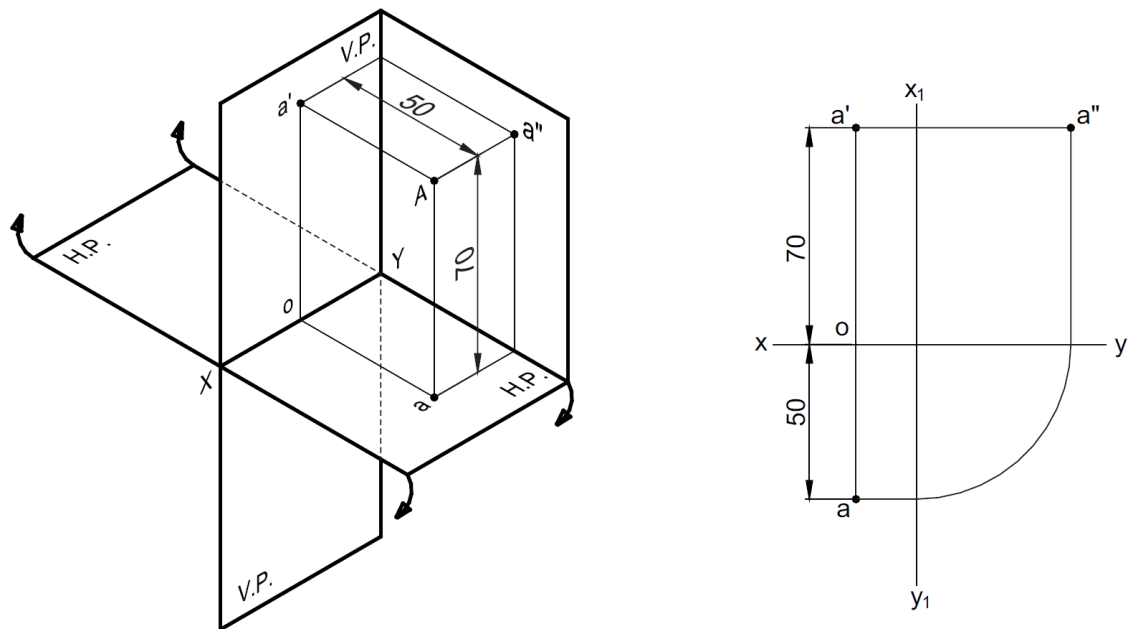
10   Solutions
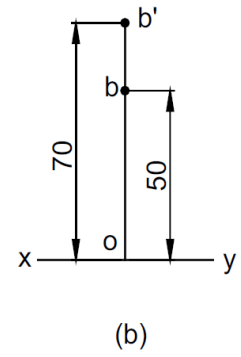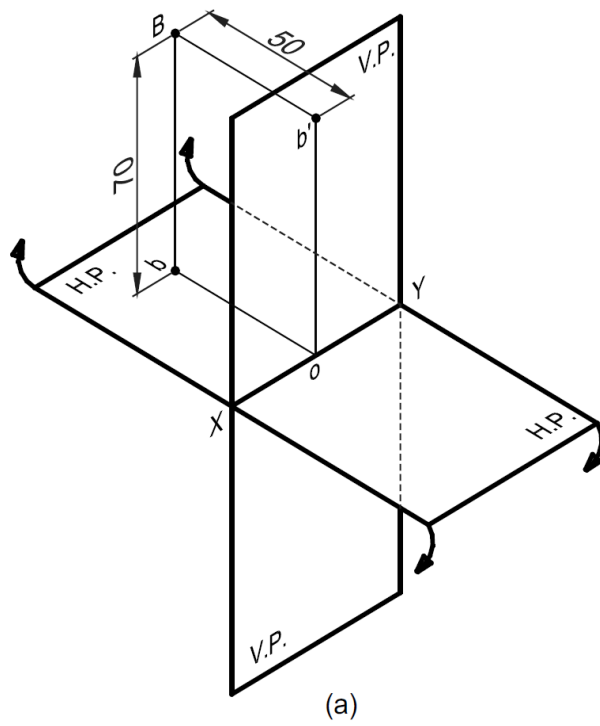

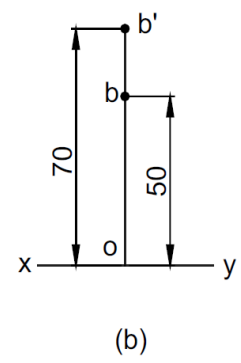**Fig. 1:** a. explanation b. Solution

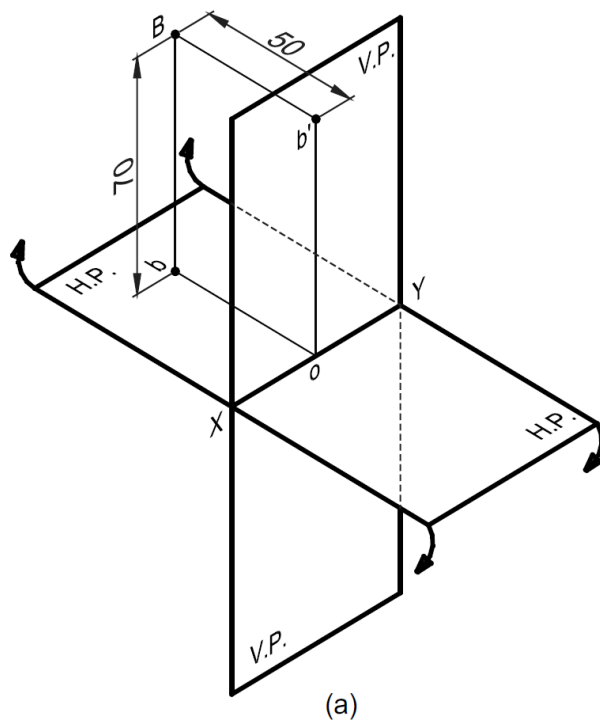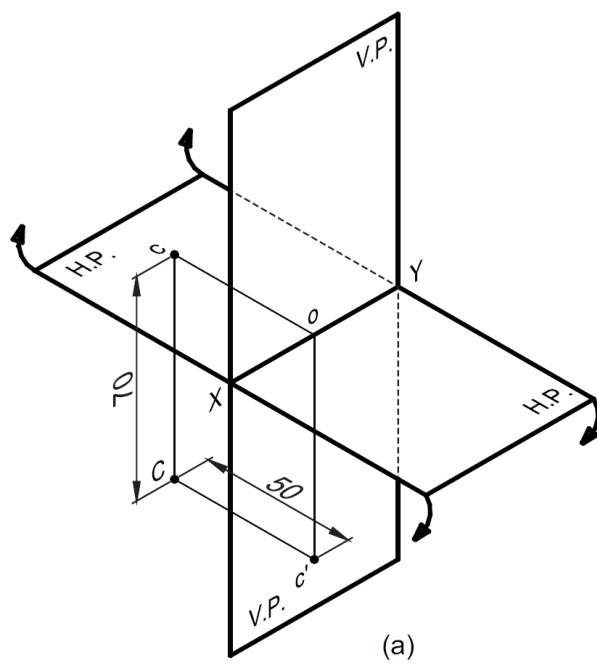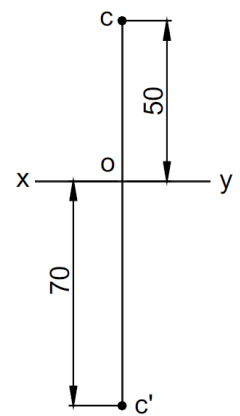**Fig. 2:** a. explanation b. Solution

Fig. 3: a. explanation b. Solution

Fig. 4: a. explanation b. Solution