Orthographic Projections - Basics

1. Drawing – The fact about

2. Drawings - Types

3. Orthographic (Definitions and Important terms)

4. Planes - Classifications

5. Pattern of planes & views

6. Methods of orthographic projections

7. 1\textsuperscript{st} angle and 3\textsuperscript{rd} angle method – two illustrations
Conversion of pictorial views into orthographic views.

1. Explanation of various terms

2. 1st angle method - illustration

3. 3rd angle method – illustration

4. To recognize colored surfaces and to draw three Views

5. Seven illustrations (no.1 to 7) draw different orthographic views

6. Total nineteen illustrations (no.8 to 26)
**DRAWINGS:**
*(A Graphical Representation)*

**The Fact about:**
If compared with Verbal or Written Description, Drawings offer far better idea about the Shape, Size & Appearance of any object or situation or location, that too in quite a less time.

Hence it has become the Best Media of Communication not only in Engineering but in almost all Fields.
Drawings
(Some Types)

Nature Drawings
(landscape, scenery etc.)

Botanical Drawings
(plants, flowers etc.)

Geographical Drawings
(maps etc.)

Zoological Drawings
(creatures, animals etc.)

Portraits
(human faces, expressions etc.)

Engineering Drawings,
(projections.)

Building Related Drawings.

Machine component Drawings

Orthographic Projections
(Fv, Tv & Sv.-Mech.Engg. terms)
(Plan, Elevation- Civil Engg.terms)
(Working Drawings 2-D type)

Isometric (Mech.Engg.Term.)
or Perspective (Civil Engg.Term)
(Actual Object Drawing 3-D)
ORTHOGRAPHIC PROJECTIONS:

IT IS A TECHNICAL DRAWING IN WHICH DIFFERENT VIEWS OF AN OBJECT ARE PROJECTED ON DIFFERENT REFERENCE PLANES OBSERVING PERPENDICULAR TO RESPECTIVE REFERENCE PLANE

Different Reference planes are

- Horizontal Plane (HP),
- Vertical Frontal Plane (VP)
- Side Or Profile Plane (PP)

And

Different Views are Front View (FV), Top View (TV) and Side View (SV)

- FV is a view projected on VP.
- TV is a view projected on HP.
- SV is a view projected on PP.

IMPORTANT TERMS OF ORTHOGRAPHIC PROJECTIONS:

1. Planes.
2. Pattern of planes & Pattern of views
3. Methods of drawing Orthographic Projections
PLANES

PRINCIPAL PLANES
HP AND VP

AUXILIARY PLANES

Auxiliary Vertical Plane (A.V.P.)
⊥ to Hp & ∠ to Vp

Auxiliary Inclined Plane (A.I.P.)
⊥ to Vp & ∠ to Hp

Profile Plane (P.P.)
⊥ to both Hp & Vp
THIS IS A PICTORIAL SET-UP OF ALL THREE PLANES.
ARROW DIRECTION IS A NORMAL WAY OF OBSERVING THE OBJECT.
BUT IN THIS DIRECTION ONLY VP AND A VIEW ON IT (FV) CAN BE SEEN.
THE OTHER PLANES AND VIEWS ON THOSE CANNOT BE SEEN.

PROCEDURE TO SOLVE ABOVE PROBLEM:-
TO MAKE THOSE PLANES ALSO VISIBLE FROM THE ARROW DIRECTION,
A) HP IS ROTATED 90° DOWNWARD
B) PP, 90° IN RIGHT SIDE DIRECTION.
THIS WAY BOTH PLANES ARE BROUGHT IN THE SAME PLANE CONTAINING VP.

On clicking the button if a warning comes please click YES to continue, this program is safe for your pc.
Methods of Drawing Orthographic Projections

First Angle Projections Method
Here views are drawn by placing object in 1\textsuperscript{st} Quadrant
\((Fv \ above \ X-y, \ Tv \ below \ X-y)\)

NOTE:-
HP term is used in 1\textsuperscript{st} Angle method &
For the same Ground term is used in 3\textsuperscript{rd} Angle method of projections

Third Angle Projections Method
Here views are drawn by placing object in 3\textsuperscript{rd} Quadrant.
\((Tv \ above \ X-y, \ Fv \ below \ X-y)\)

SYMBOLIC PRESENTATION OF BOTH METHODS WITH AN OBJECT STANDING ON HP (GROUND) ON IT’S BASE.
In this method, the object is assumed to be situated in first quadrant means above HP & in front of VP.

Object is in between observer & plane.

Actual pattern of planes & views in first angle method of projections.
THIRD ANGLE PROJECTION

IN THIS METHOD, THE OBJECT IS ASSUMED TO BE SITUATED IN THIRD QUADRANT (BELOW HP & BEHIND OF VP.)

PLANES BEING TRANSPARENT AND INBETWEEN OBSERVER & OBJECT.

ACTUAL PATTERN OF PLANES & VIEWS OF THIRD ANGLE PROJECTIONS
ORTHOGONOGIC PROJECTIONS
{ MACHINE ELEMENTS }

OBJECT IS OBSERVED IN THREE DIRECTIONS.
THE DIRECTIONS SHOULD BE NORMAL
TO THE RESPECTIVE PLANES.
AND NOW PROJECT THREE DIFFERENT VIEWS ON THOSE PLANES.
THESE VIEWS ARE FRONT VIEW, TOP VIEW AND SIDE VIEW.

FRONT VIEW IS A VIEW PROJECTED ON VERTICAL PLANE (VP)
TOP VIEW IS A VIEW PROJECTED ON HORIZONTAL PLANE (HP)
SIDE VIEW IS A VIEW PROJECTED ON PROFILE PLANE (PP)

FIRST STUDY THE CONCEPT OF 1ST AND 3RD ANGLE
PROJECTION METHODS

AND THEN STUDY NEXT 26 ILLUSTRATED CASES CAREFULLY.
TRY TO RECOGNIZE SURFACES PERPENDICULAR TO THE ARROW DIRECTIONS
IN THIS METHOD, THE OBJECT IS ASSUMED TO BE SITUATED IN FIRST QUADRANT MEANS ABOVE HP & INFRONT OF VP.

OBJECT IS INBETWEEN OBSERVER & PLANE.

ACTUAL PATTERN OF PLANES & VIEWS IN FIRST ANGLE METHOD OF PROJECTIONS.
THIRD ANGLE PROJECTION

IN THIS METHOD, THE OBJECT IS ASSUMED TO BE SITUATED IN THIRD QUADRANT (BELOW HP & BEHIND OF VP.)

PLANES BEING TRANSPARENT AND INBETWEEN OBSERVER & OBJECT.

ACTUAL PATTERN OF PLANES & VIEWS OF THIRD ANGLE PROJECTIONS
PICTORIAL PRESENTATION IS GIVEN
DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN
DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT

BY FIRST ANGLE PROJECTION METHOD

FOR S.V.

FOR T.V.

TOP VIEW

FRONT VIEW

L.H. SIDE VIEW

ORTHOGRAPHIC PROJECTIONS
PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT

BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN
DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN
DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
STUDY ILLUSTRATIONS FOR T.V.

ORTHOGRAPHIC PROJECTIONS

FRONT VIEW

TOP VIEW

PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT

BY FIRST ANGLE PROJECTION METHOD
FOR T.V.

PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

ORTHOGONAL PROJECTIONS

FRONT VIEW

L.H.SIDE VIEW

TOP VIEW
PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN
DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN
DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
STUDY ILLUSTRATIONS

FOR T.V.

FOR F.V.

ORTHOGRAPHIC PROJECTIONS

PICTORIAL PRESENTATION IS GIVEN

DRAW FV AND TV OF THIS OBJECT

BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN
DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

ORTHOGONAL PROJECTIONS

FV

SV

TV

ALL VIEWS IDENTICAL
STUDY ILLUSTRATIONS

FOR T.V.

ORTHOGRAHOMIC PROJECTIONS

ALL VIEWS IDENTICAL

FV

SV

PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
FOR T.V.

PICTORIAL PRESENTATION IS GIVEN

DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

ORTHOGRAPHIC PROJECTIONS

ALL VIEWS IDENTICAL

FV

SV

TOP VIEW

FOR E.V.
PICTORIAL PRESENTATION IS GIVEN

DRAW FV AND SV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
ORTHOGRAPHIC PROJECTIONS

FOR T.V.

PICTORIAL PRESENTATION IS GIVEN
DRAW FV AND TV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN
DRAW FV AND TV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN
DRAW FV AND TV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

ORTHOGONIC PROJECTIONS

FV

TV

TOP VIEW
PICTORIAL PRESENTATION IS GIVEN
DRAW FV AND SV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN

DRAW FV AND TV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN
DRAW FV ABD SV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN
DRAW FV AND TV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN

DRAW FV AND LSV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD
PICTORIAL PRESENTATION IS GIVEN
DRAW FV AND SV OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

ORTHOGONAPHIC PROJECTIONS

F.V.  LEFT S.V.

FOR S.V.  FOR F.V.