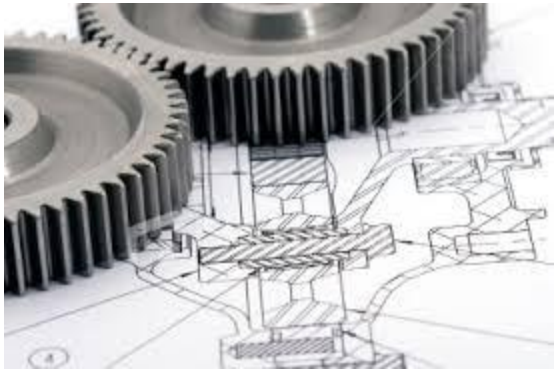
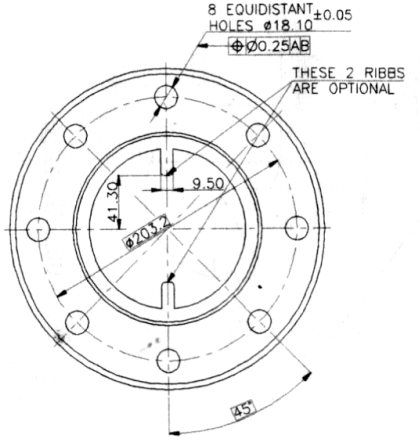
ENGINEERING GRAPHICS

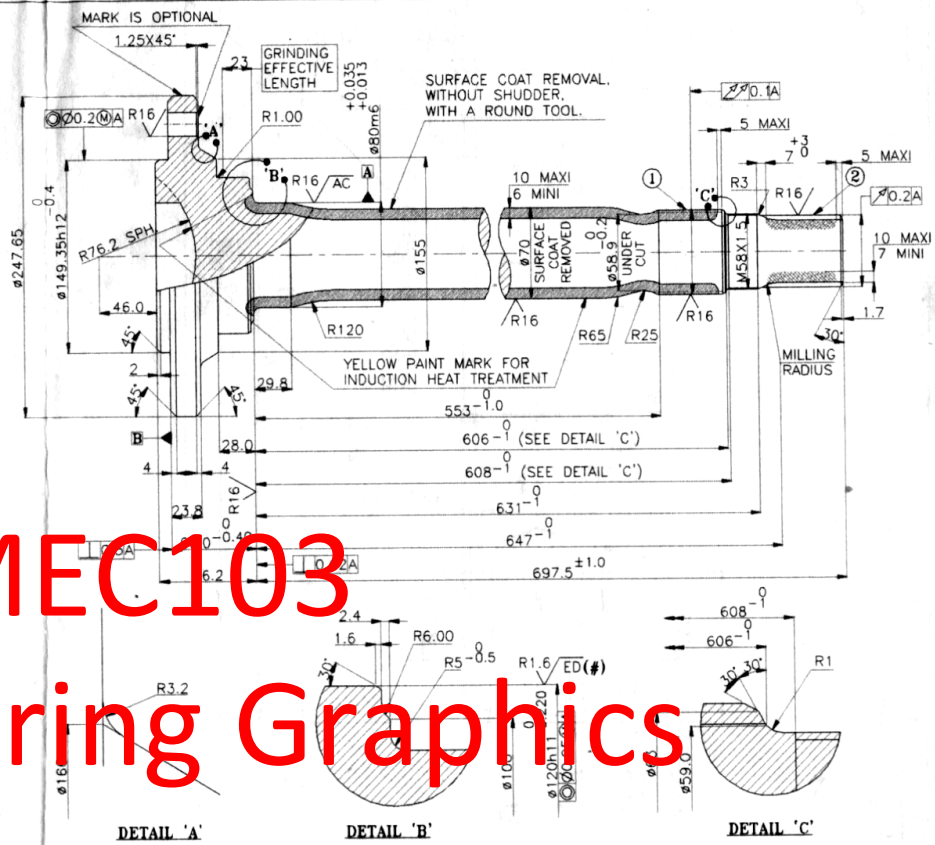
MEC103



A3	DRG.NO. FF2401001x	IF IN DOUBT ASK	CHECK DRAWING WITH LATEST REVISION	DO NOT SCALE

MATERIAL:-
42CrMo4
STD NFE N10083





EXCEPT OTHER INFORMATION		
PROTECTION	ACCORDING TO STANDARD	01-71-002
	ACCORDING TO STANDARD	47-01-003
COLOUR		
THREADING		ISO 965-3 QUALITY 6 G/6g
GENERAL TOLERANCES FOR DIMENSIONS		ISO 2768 m K
GENERAL TOLERANCES FOR MOULDED PARTS		ISO 8062-CT9
SECURITY AND REGULATION		00-10-040
GENERAL INSTRUCTIONS FOR PRODUCT SUPPLYING		00-10-415
SHAPE AND POSITION TOLERANCES		01-[illegible]-501
SURFACE GEOMETRIC FINISH		01-10-[illegible]02
THERMOCHEMICAL TREATMENTS		02-50-[illegible]07
CIRCULAR STAMPED HOLES		01-50-101
PUNCHED ROUND SLOTS		01-50-102
ELECTRICAL ARC WELDING SEFG		01-50-911
RESISTANCE SPOT WELDING SRP		01-50-912
CLEANING LEVEL		180887
BURRS		NF E81-010 CLASS B

INVOLUTE SPLINE DATA	①	②
NUMBER OF TEETH	24	20
MODULE	2.5	2.5
PRESSURE ANGLE	20°	20°
MAJOR DIAMETER	65 -0.100 -0.130	55 -0.100 -0.130
MINOR DIAMETER	59	49
BASE CIRCLE DIAMETER	56.382	46.985
PITCH CIRCLE DIAMETER	60	50
4 TEETH M.O.T(sp.1)/3 TEETH M.O.T(sp.2)	28.040 -0.118 -0.070	20.519 -0.070 -0.118
DIAMETER OVER PINS	69.579 -0.140 -0.236	59.446 -0.135 -0.228
PIN DIAMETER	4.50	4.50
PROFILE DISPLACEMENT	0.800	0.800
TOOTH WIDTH AT PITCH CIRCLE DIAMETER	5.3830	5.3830
TOOTH WIDTH AT BASE CIRCLE DIAMETER	5.8990	5.7580
RADIUS MAXI ON ROOT FOR FLAT	0.7500	0.7500
CHAMFER SEMI-TOPING	0.2500	0.2500

OIL HARDENING AND TEMPERING (ON ROUGH PART) FOR HB 220-260 LOCAL TREATMENT:-

- DEPTH AT HV400 : SEE SHADED AREA
- INDUCTION HARDENING
- TEMPERING FOR STRESS RELIEF AT 200°C TO 220°C FOR MINIMUM 2 HOURS

-SURFACE HARDNESS HV>=510
-CHECK THE ABSENCE OF CRACKS

 # NOTE FOR SURFACE FINISH ON DIA 120 h11

FINAL MACHINING MARKS TO BE CONTROLLED PERPENDICULAR TO THE PRINCIPAL AXIS OF THE SHAFT, ACCORDING TO RNLT. STD. 35-00-815

MOD NO.	MODIFICATION	ZONE	SIGN	DATE

ABC products.

DRN.	Sudhir Kumar	TITLE:	FULLY FINISH DRAWING WHEEL SHAFT
CHD.	ARCH		
APP.			
DTD.	03/11/01	MAT.:-	REF. NO. 30058550
SCALE	N.T.S	SEE DETAIL	DRG. NO. FF2401001x A3
SHEET	01 OF 01		

Course details

- LTP – 2 2 0 [Two lectures/Two Tutorials/week]

- Credit:3.0

Syllabus

MEC103:ENGINEERING GRAPHICS

L:2 T:2 P:0

Course Objectives:

- To inculcate the knowledge of basic geometries, geometric tools, shapes and procedures used for engineering drawings. .
- To have detailed conceptual knowledge about the dimensioning, specifications and conventions.
- To have an understanding of different concepts of theory of projections, development, sectioning and 3-D representations of objects. .

Unit I

Introduction to Engineering Drawing : Principles of Engineering Graphics and their significance, Drawing instruments.

Lettering in vertical Gothic letters using single stoke, Dimensioning

Scales- Plain and diagonal scale,

Conic sections including Ellipse by rectangle and concentric circle methods, Parabola by rectangular method, Involute of circle and polygon,

Syllabus

Unit IV

Sectional views : Sectioning webs and ribs, Importance of sectioning, Types of section including full section, offset section and half section.

Unit V

Development of Surfaces : Methods of development, Parallel line development of cylinder and prism, Radial line development of cone and pyramid.

Unit VI

Isometric Projections : Principles of Isometric Projections, Isometric Scale , Terminology, Isometric view of step, inclined, oblique, cylindrical blocks, Isometric Dimensioning.

Course Assessment Model

Marks break up*	
Attendance	5
CA (one best out of two tasks)	
– Ten Best grid sheet out of twelve	20
MTE	25
ETE	50
Total	**100**

- Six grid sheet before MTE six after MTE
- One class test before MTE
- One class test after MTE

Books

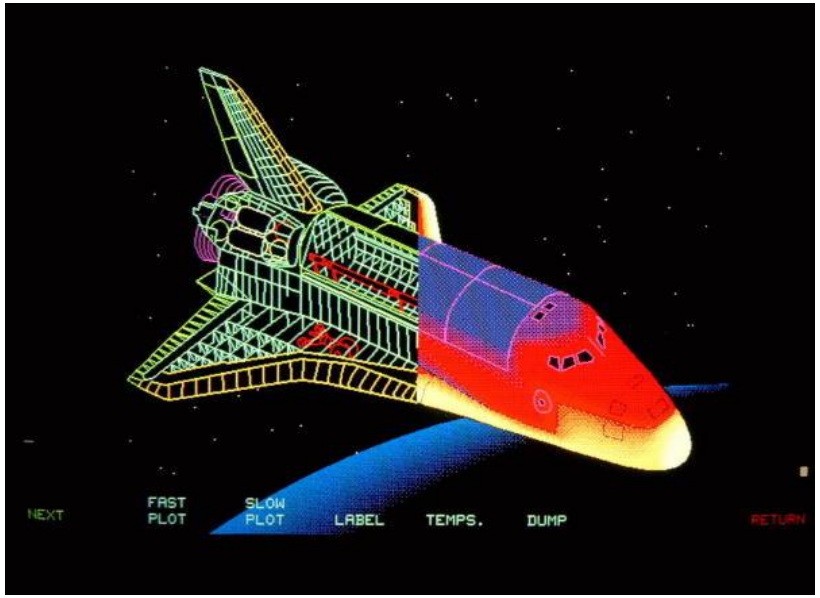
Text Books:

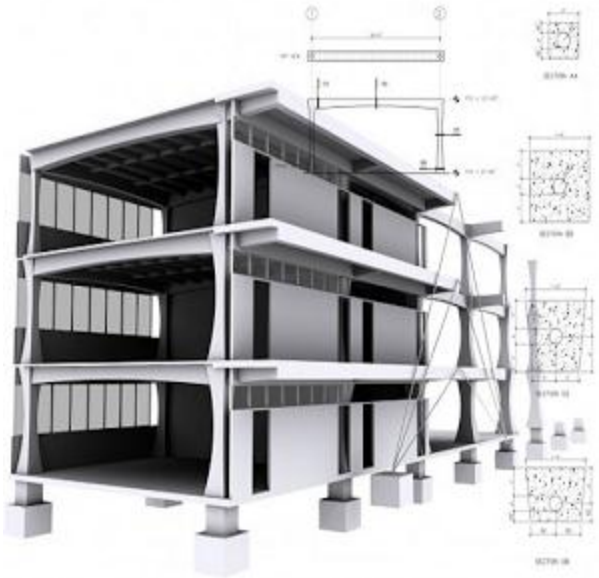
1. ENGINEERING DRAWING WITH AN INTRODUCTION TO AUTOCAD by DHANANJAY A JOLHE, MC GRAW HILL, 4th Edition, (2010)

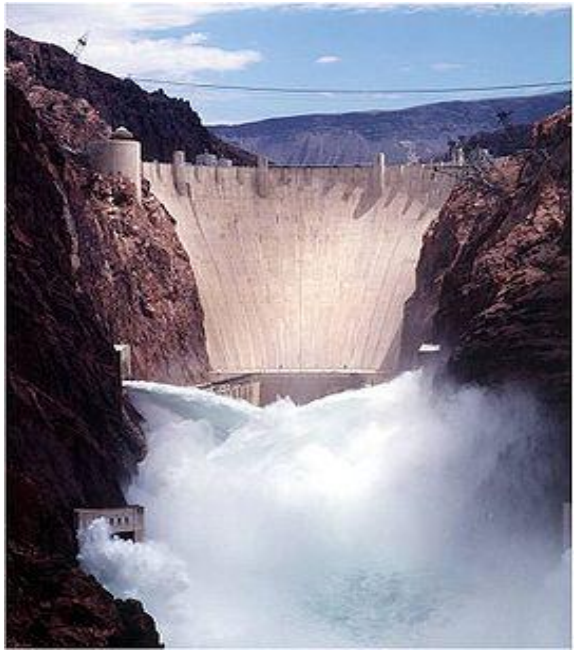
References:

1. ENGINEERING DRAWING by M.B.SHAH,BC RANA, PEARSON EDUCATION, INC., 3rd Edition, (2012)
2. ENGINEERING DRAWING by N.D. BHAT & M. PANCHAL, CHAROTAR PUBLISHING HOUSE PVT LTD, 1st Edition, (2008)

Applications

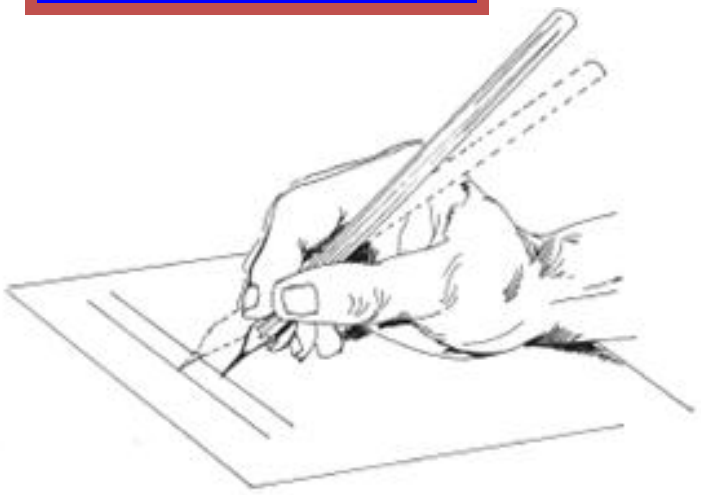




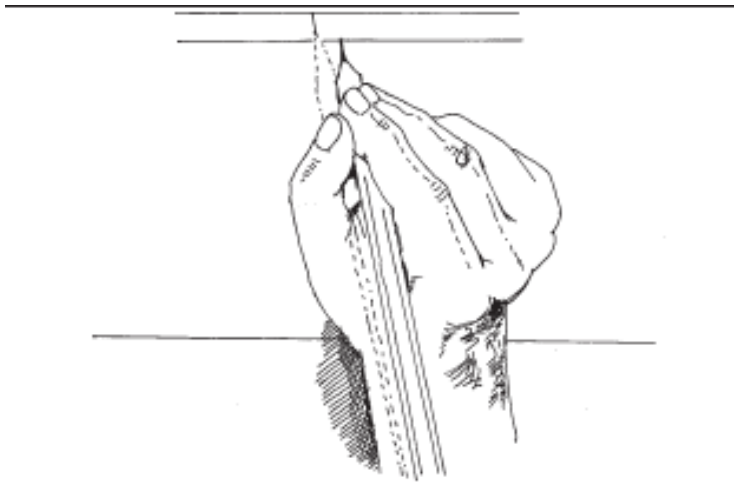


Unit 1(**Introduction to Engineering Drawing)**

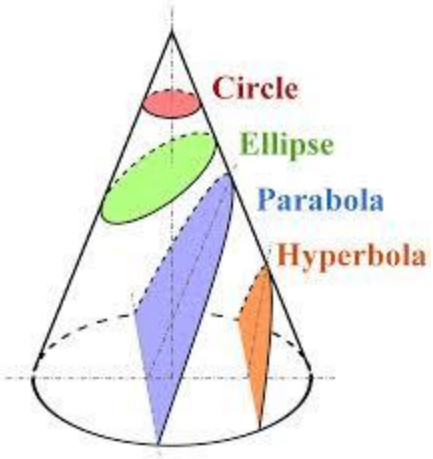
LETTERING

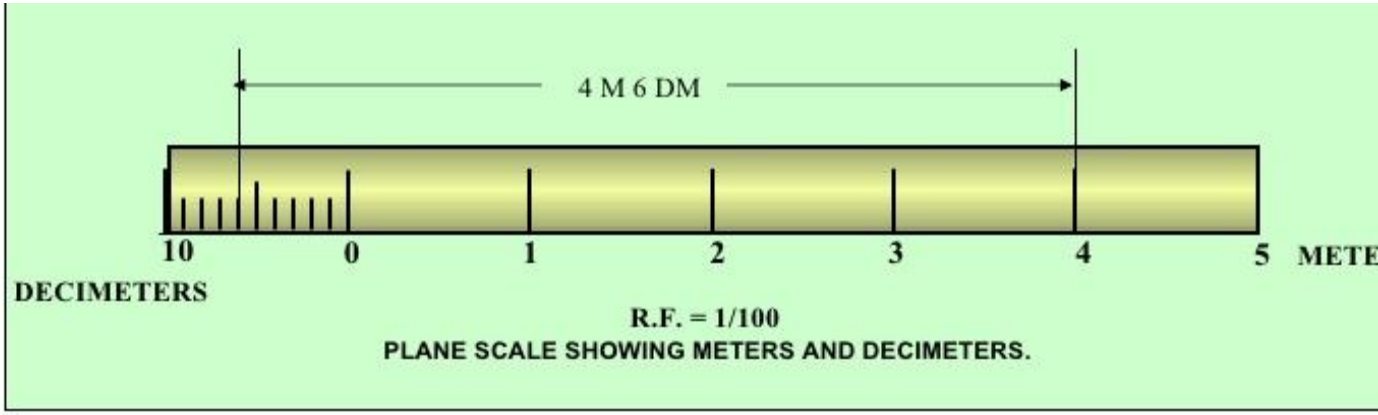


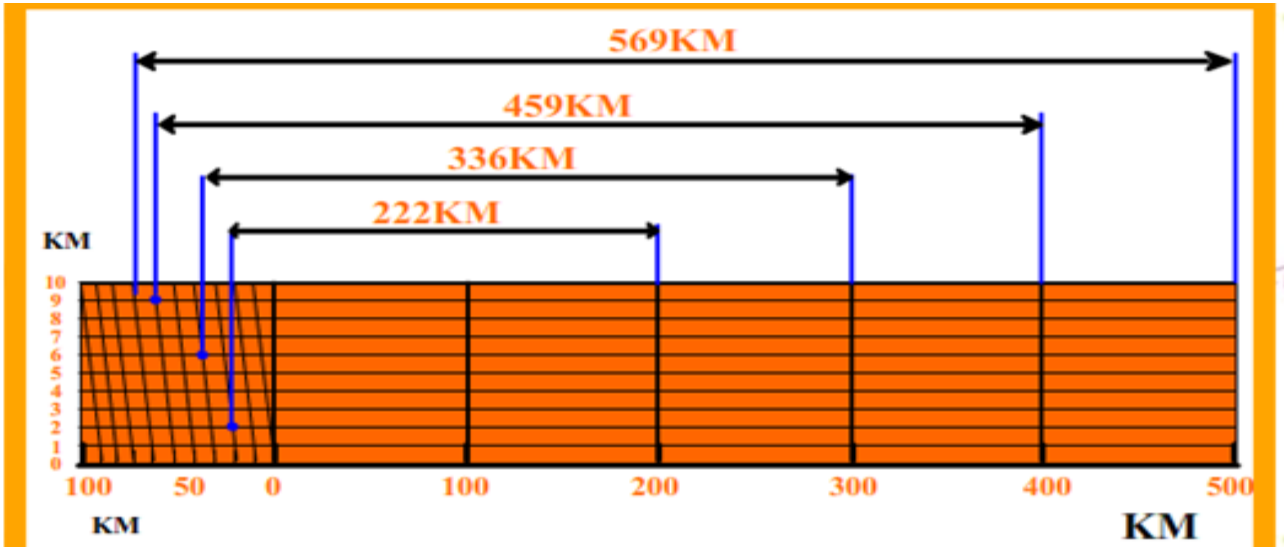
Vertical Stroke made by finger moment only



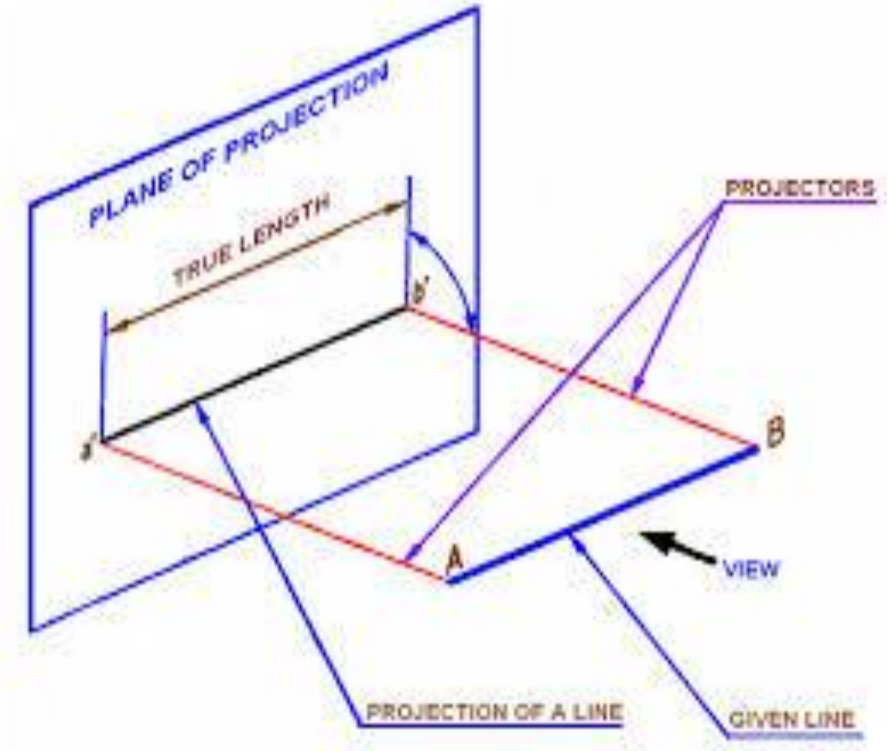
Horizontal stroke are made by pivoting the the whole hand at the wrist

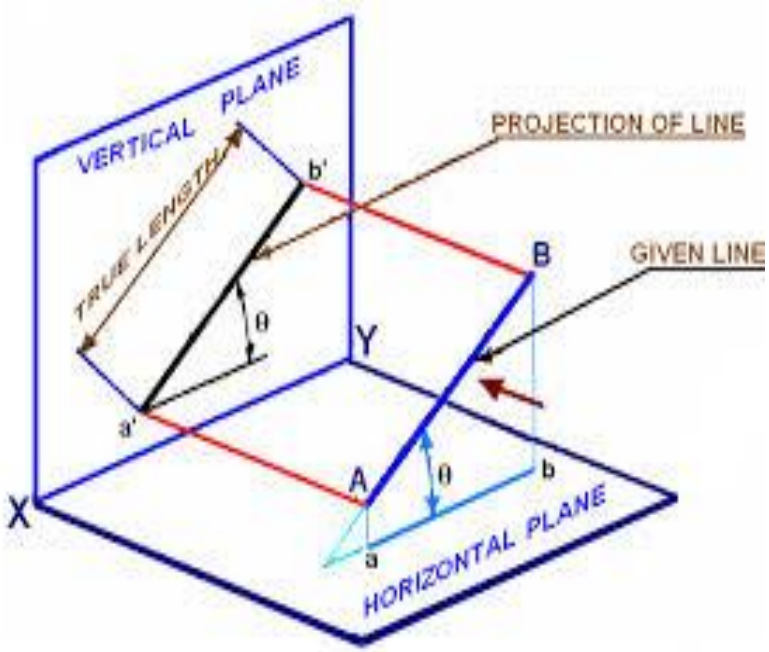

Circle
Ellipse
Parabola
Hyperbola

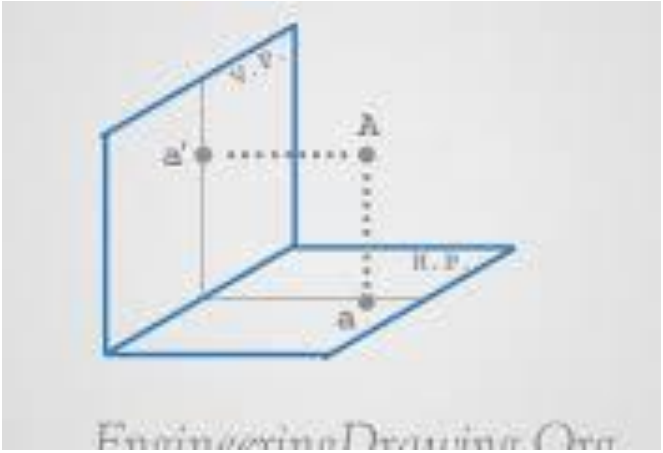

4 M 6 DM
10
0
1
2
3
4
5
METE
DECIMETERS
R.F. = 1/100
PLANE SCALE SHOWING METERS AND DECIMETERS.


569KM
459KM
336KM
222KM
KM
10
9
8
7
6
5
4
3
2
1
0
100
50
0
100
200
300
400
500
KM
KM

Unit 2(**Projections of Points, Lines and Planes)**

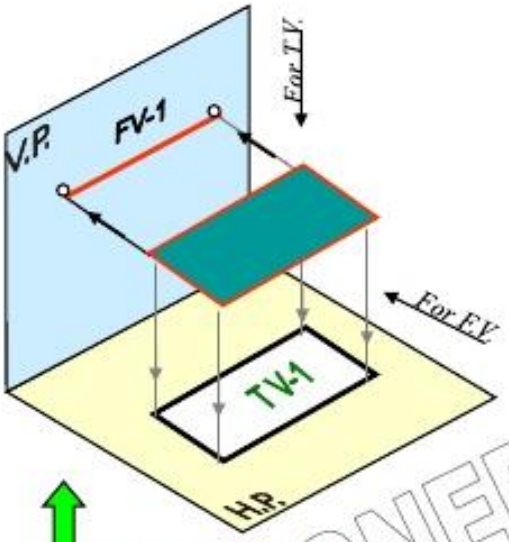






SURFACE **PARALLEL** TO HP

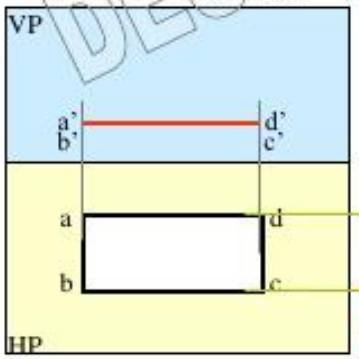
PICTORIAL PRESENTATION



ORTHOGRAPHIC

TV-True Shape

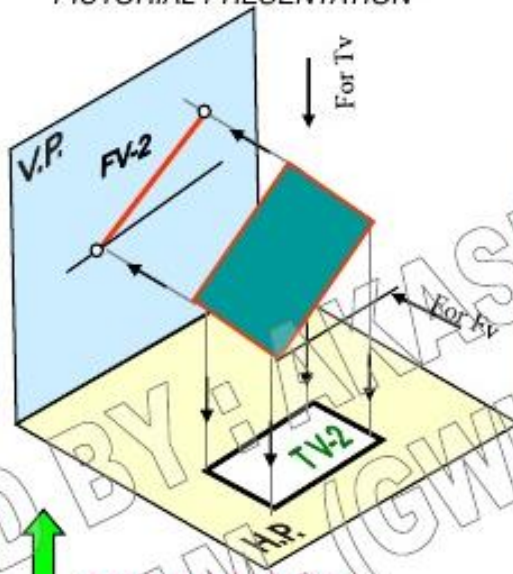
FV- Line // to xy



A

SURFACE **INCLINED** TO HP

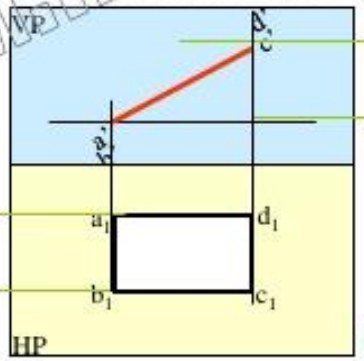
PICTORIAL PRESENTATION



ORTHOGRAPHIC

FV- Inclined to XY

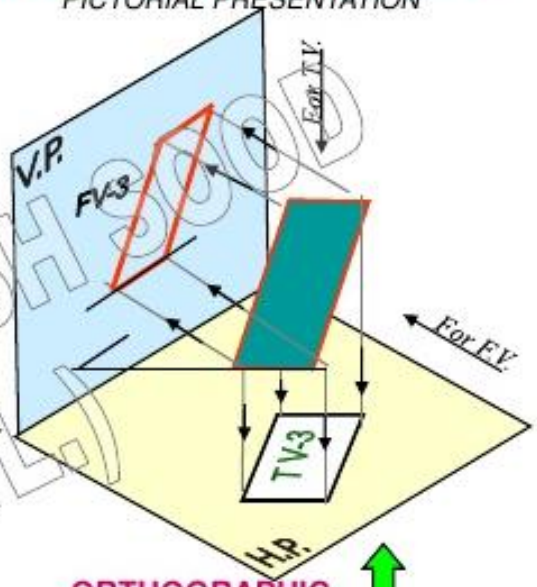
TV- Reduced Shape



B

ONE SMALL SIDE INCLINED TO VP

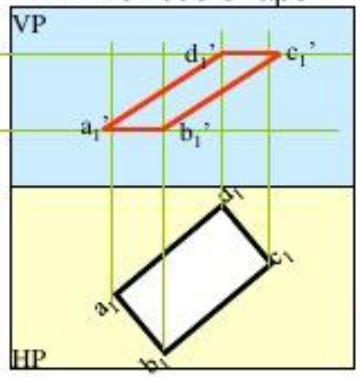
PICTORIAL PRESENTATION



ORTHOGRAPHIC

FV- Apparent Shape

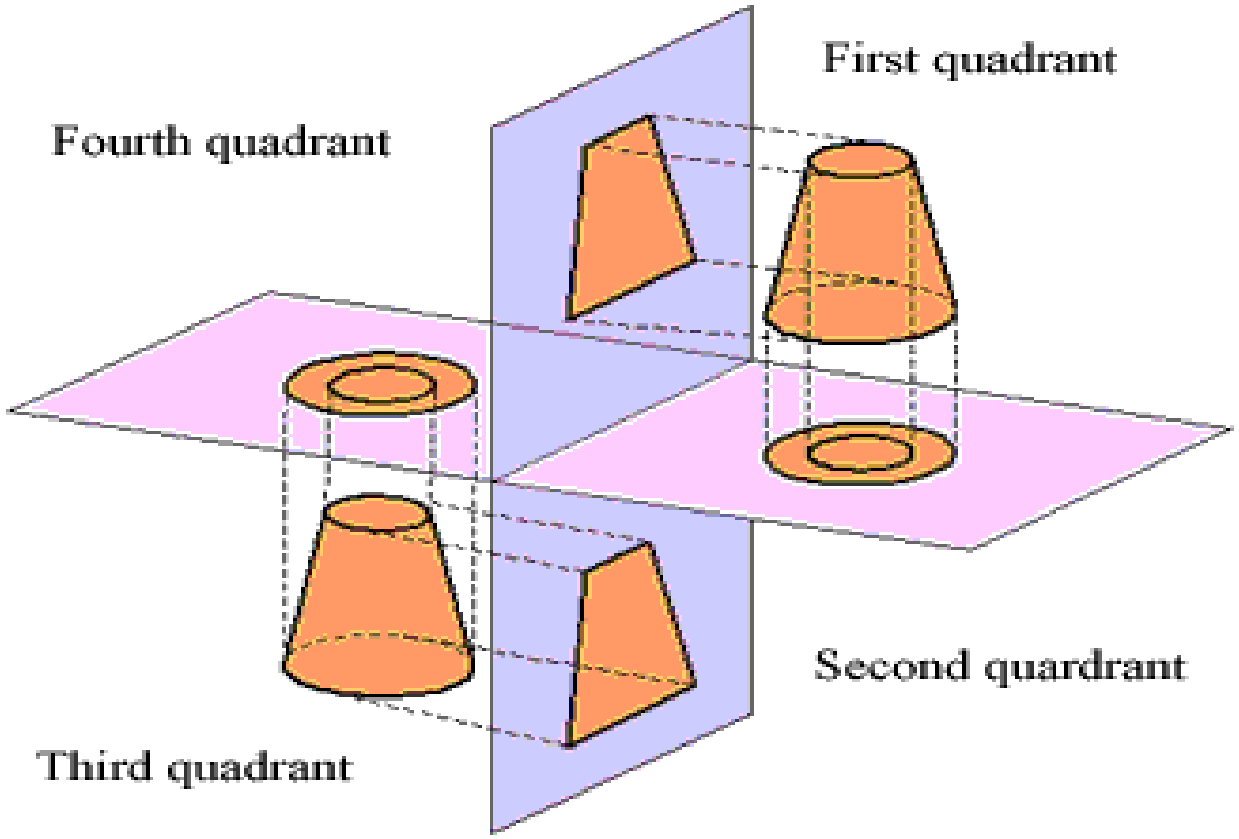
TV-Previous Shape

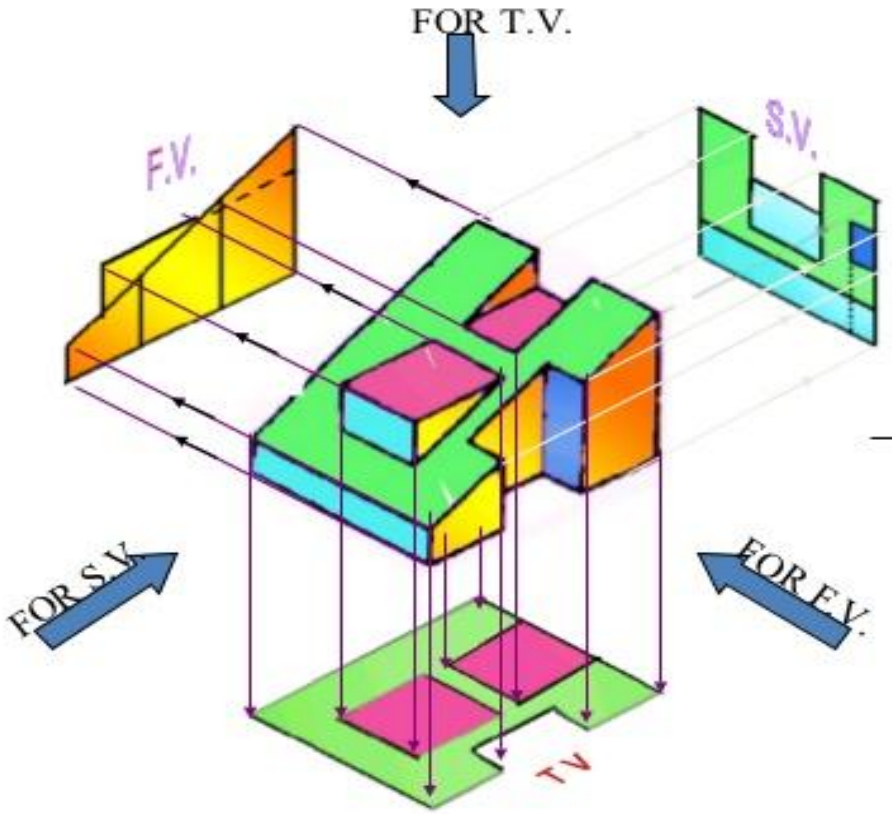


C

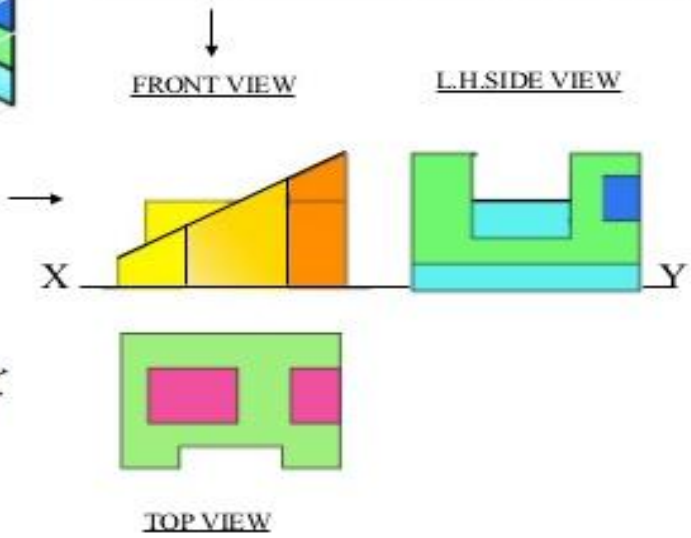
Unit 3(**Orthographic Projections)**

Conversion of 3 D into 2 D





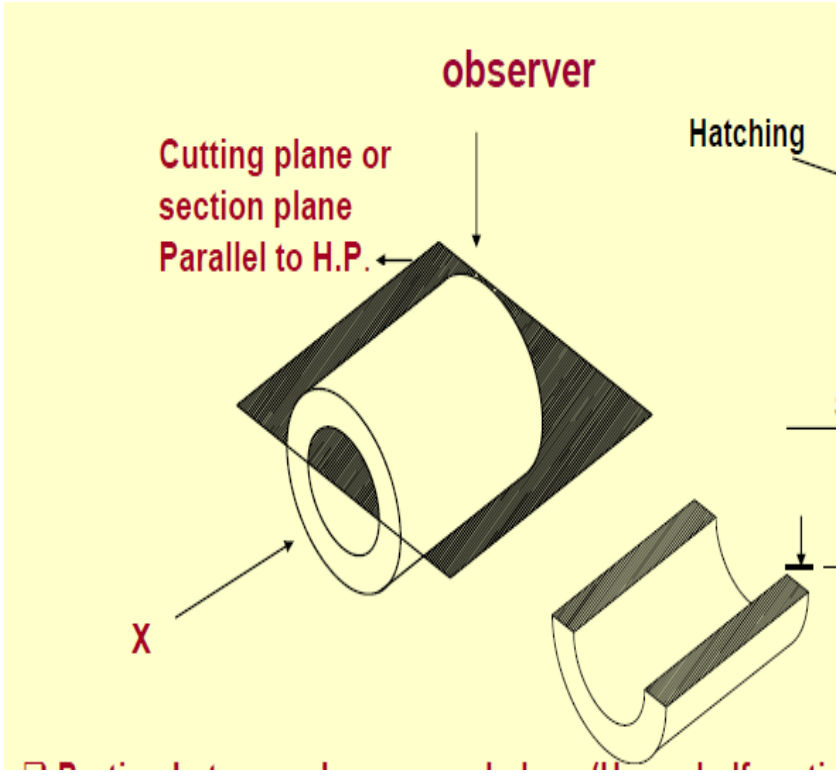
ORTHOGRAPHIC PROJECTIONS

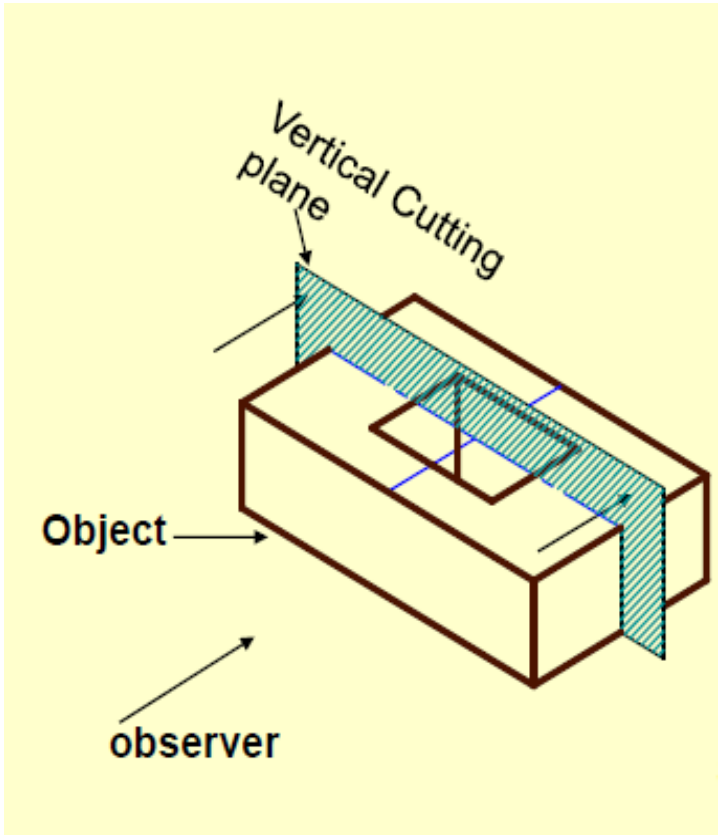


PICTORIAL PRESENTATION IS GIVEN

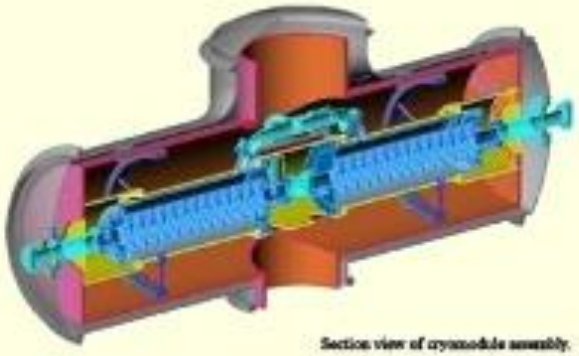
DRAW THREE VIEWS OF THIS OBJECT
BY FIRST ANGLE PROJECTION METHOD

Unit 4(Sectional views)

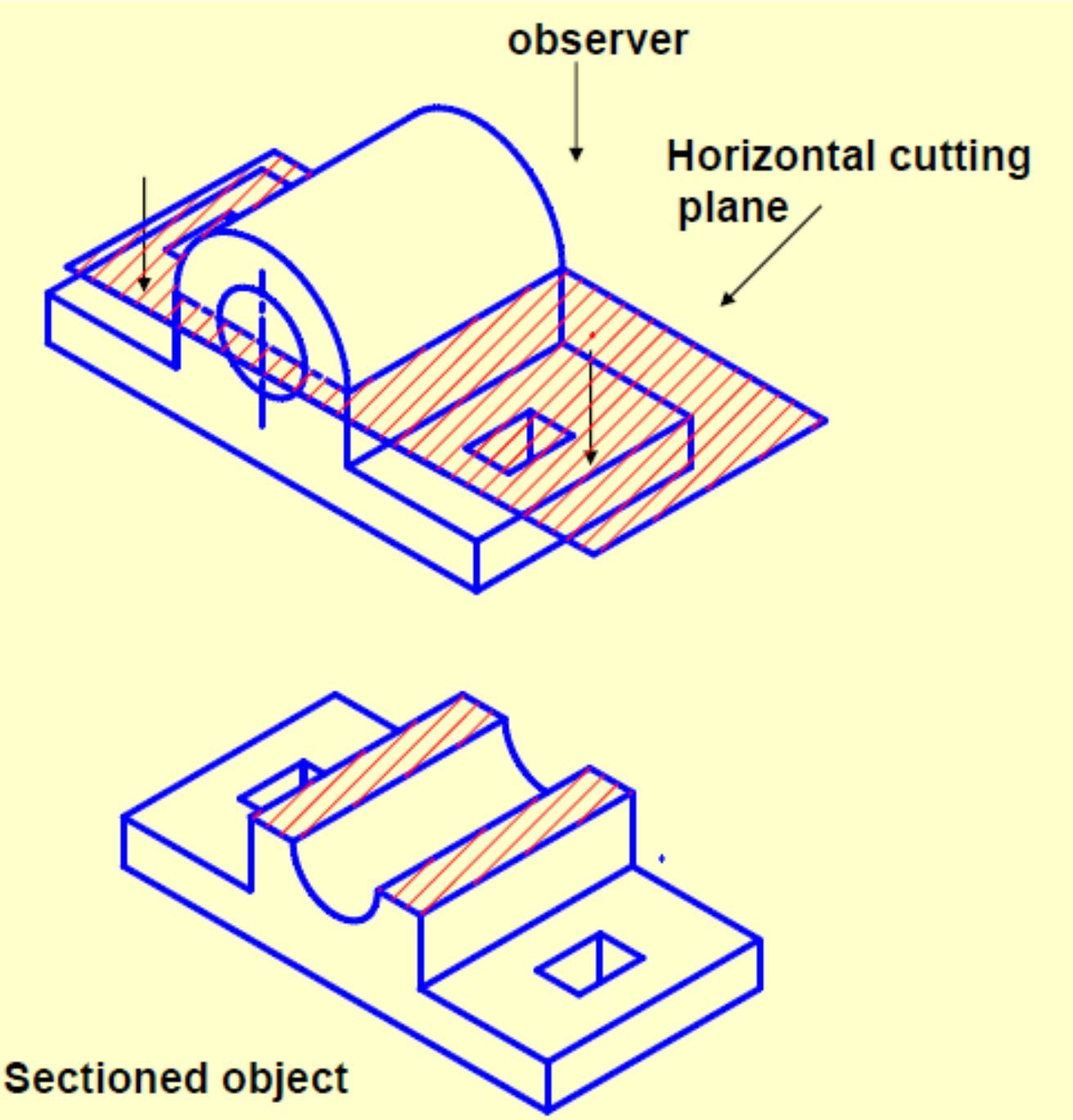




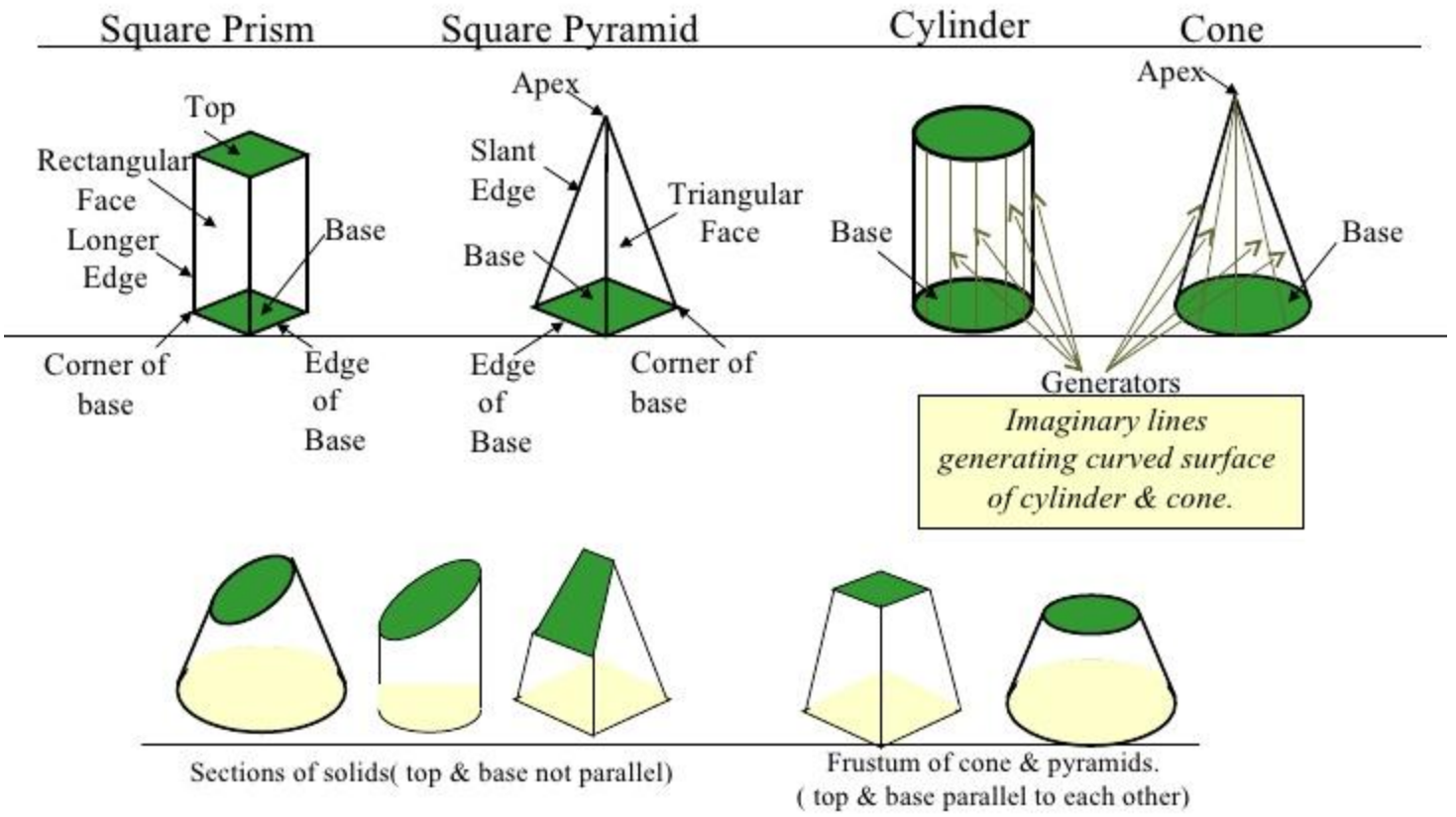
Section Views



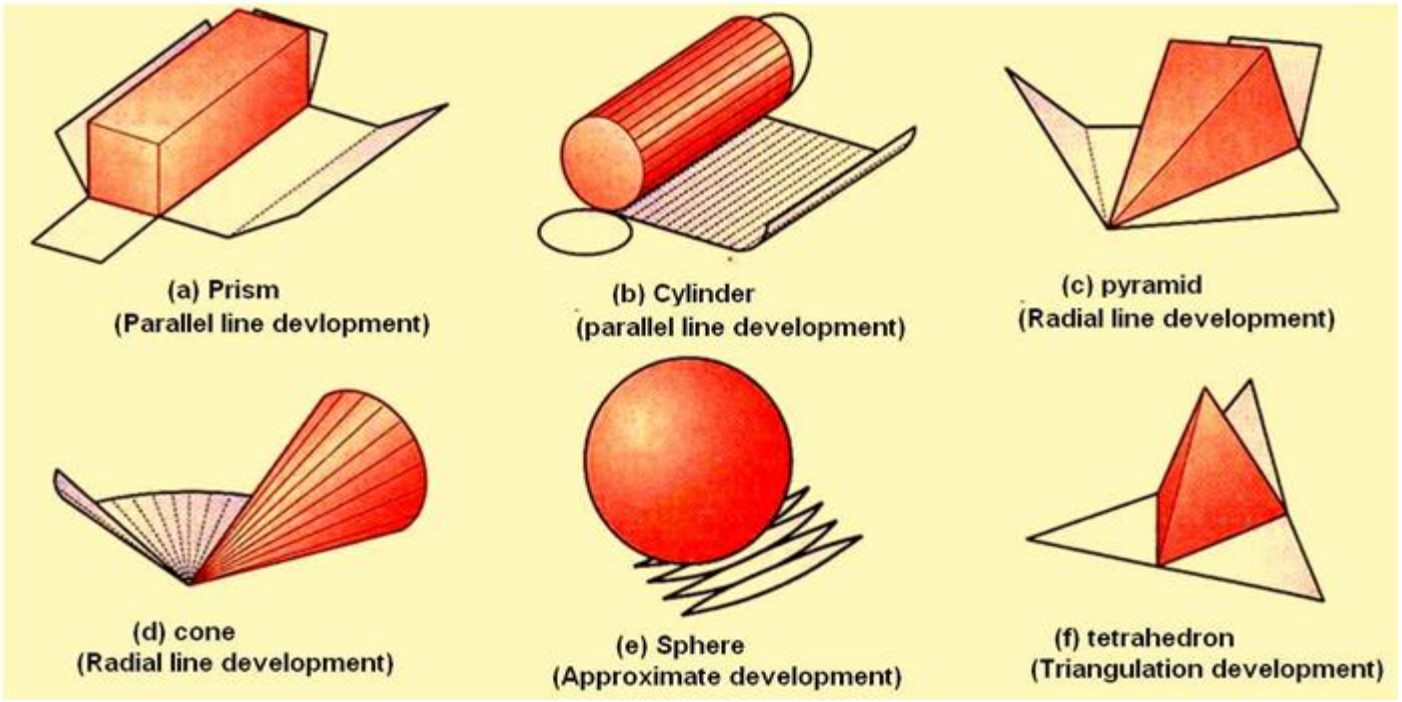
Section view of cryomodule assembly.


observer
Horizontal cutting plane
Sectioned object

Unit 5(Development of Surfaces)



When the surfaces of a solid are laid out on a plane, the
figure obtained is called its development.



Application of development

Packaging Industry
Aircraft,
Automobile,
Shipbuilding Industry
Boilers, Bins, Hoppers ...
Funnels, AC ducts etc.

Unit 6(Isometric Projections)