

A Laboratory Manual for
Engineering Graphics(EGM)
(22002)

Semester- I

Diploma in Engineering
(ME/CH)



BharatiVidyapeeth Institute of Technology

Navi Mumbai

BharatiVidyapeethInstitute of



Technology

Navi Mumbai

Certificate

This is to certify that, Mr./ Ms.Roll No. of first Semester Diploma in Engineering of BharatiVidyapeeth Institute of Technology Navi Mumbai (Inst. code:) has satisfactorily completed the term work in the subject of Engineering Graphics(EGM) (22002) for the academic year 20.... to 20.....as prescribed in the MSBTE curriculum.

Place:

Enrollment No. :

Date:

Exam. Seat No.:

Sign:

Name:

Subject Teacher

Head of the Department

Principal



SKETCH BOOK FOR ENGINEERING GRAPHICS

Course –ME/CH

Maximum Marks-

Year/Semester – First

Minimum Marks-

Exercise No.	Name of Exercise	Page No	Date of performance	Date of assessment	Remark
1	Draw horizontal, vertical, 30 degree, 45 degree, 60 and 75 degrees lines, different types of lines, dimensioning styles using Mini drafter	2			
2	Write alphabets and numerical (Vertical only)	3			
3	Draw regular geometric constructions and redraw the given figure	4			
4	Draw one figure showing dimensioning techniques	7			
5	Methods to draw an ellipse by Arcs of circle and Concentric circles method.	9			
6	Methods to draw a parabola by Directrix Focus method and Rectangle method	11			
7	Methods to draw a hyperbola by Directrix Focus method	12			
8	Methods to draw involutes: circle and pentagon	14			
9	Methods to draw Cycloidal curve: cycloid, . epicycloid and hypocycloid	19			
10	Methods to draw Helix and Archimedean spiral.	22			
11	Loci of points on Single slider crank mechanism with given specifications	24			
12	Draw the orthographic views from given pictorial views.	25			
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EXERCISE NO.1

Draw horizontal, vertical, 30 degree, 45 degree, 60 and 75 degrees lines, different types of lines, dimensioning styles using Mini drafter








EXERCISE NO.2

Write alphabets and numerical (Vertical only)

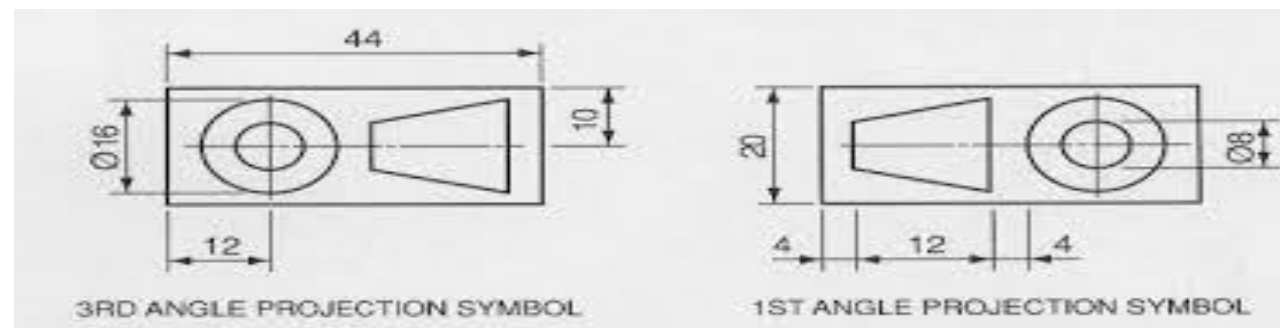
EXERCISE NO.3

Draw regular geometric constructions and redraw the given figure

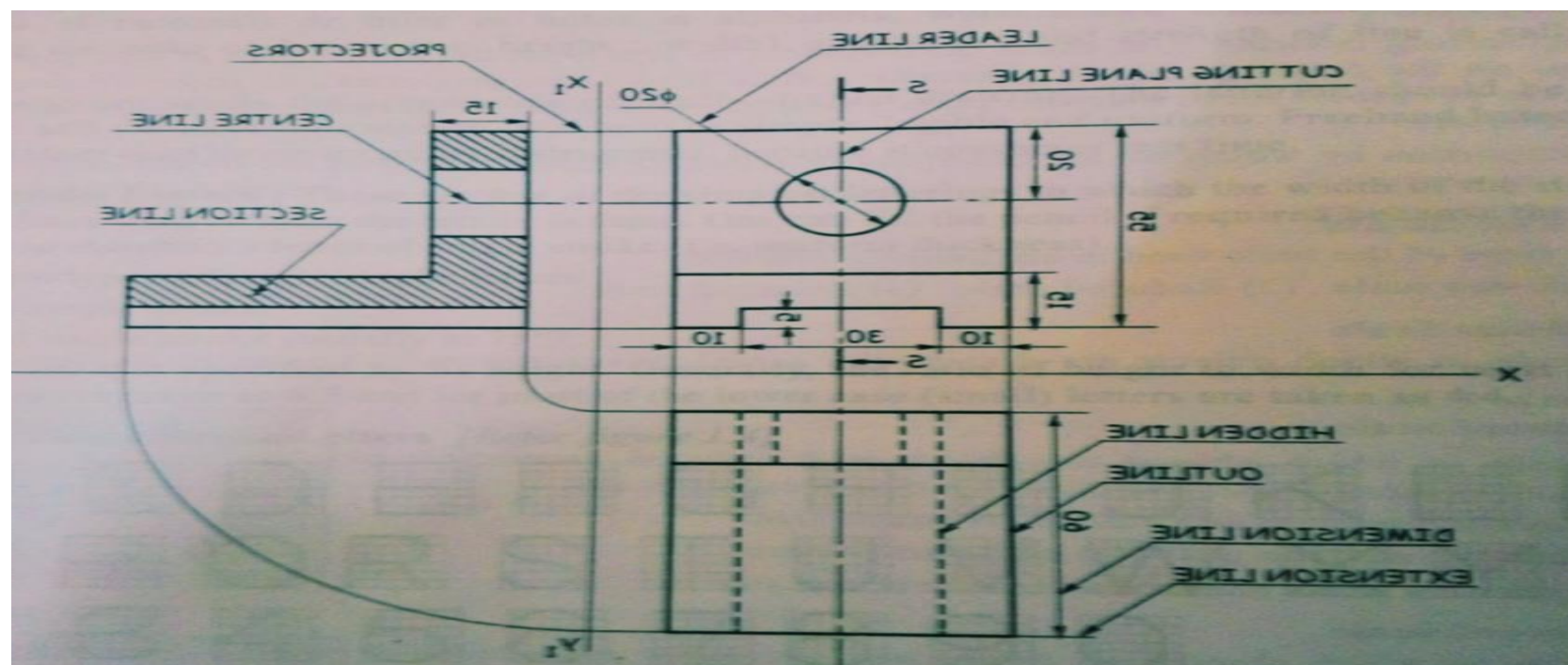
Convention of lines and their applications

Illustration	Application
Thick 	Outlines, visible edges, surface boundaries of objects, margin lines
Continuous thin 	Dimension lines, extension lines, section lines leader or pointer lines, construction lines, boarder lines
Continuous thin wavy 	Short break lines or irregular boundary lines – drawn freehand
Continuous thin with zig-zag 	Long break lines
Short dashes, gap 1, length 3 mm 	Invisible or interior surfaces
Short dashes 	Center lines, locus lines Alternate long and short dashes in a proportion of 6:1,
Long chain thick at end and thin elsewhere 	Cutting plane lines

Symbols for method of projection



Representation of lines with orthographic view of object

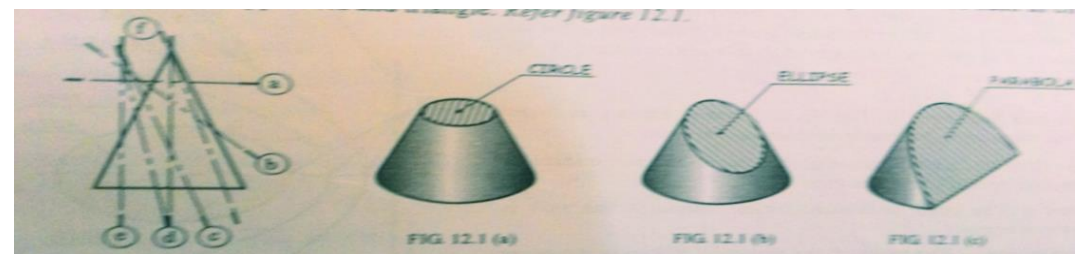


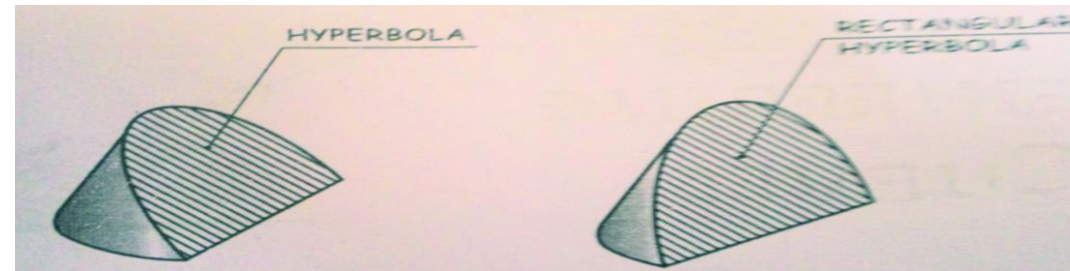
EXERCISE NO.4

- Draw one figure showing dimensioning techniques

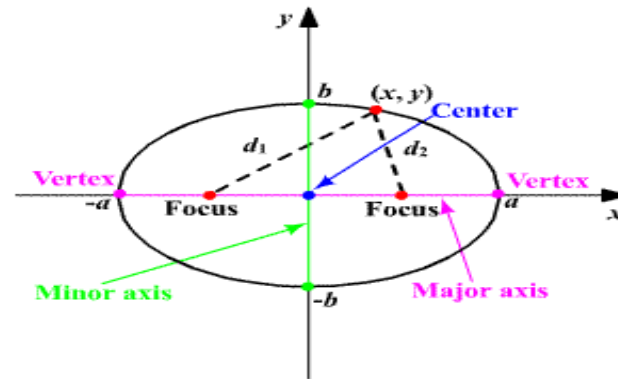
Engineering curves and loci of points

2.1 Conic sections





2.1.1 Ellipse –



EXERCISE NO.5**i)Arcs of circle method**

1)Two fixed points F1 and F2 are 110mm apart . Draw the path traced out by a point P, moving in the same plane as F1 and F2, such that sum of its distances from F1 and F2 always same and is equal to 120mm.

ii) Concentric circle method

Draw an ellipse, having major and minor axes 140mm and 80mm respectively by concentric circle method.

EXERCISE NO.6**i) Directrix focus method**

A fixed point F is 90mm from a fixed straight line AB. Draw parabola by directrix focus method.

ii) Rectangle method

A ball thrown up in air reaches a maximum height of 70 meters and travels a horizontal distance of 90 meters .Draw the path of ball assuming it to be parabolic.

EXERCISE NO.7**7.1 Hyperbola****i) Transverse axis and focus method.**

1) Two fixed points F_1 and F_2 are 80mm apart. Draw the curve traced out by a point P moving in such a way that the difference between its distances from F_1 and F_2 is always constant and equal to 40mm. Name the curve.

2) A point P is 40mm and 60mm away from two fixed straight lines, which are at right angles to each other. Draw the hyperbola passing through P within 15mm distance from each line.

Rectangular Hyperbola

1) Two straight lines OX and OY make an angle of 70 degrees between them. P is a point 40mm from OX and 30mm from OY. Draw a hyperbola through P with OX and OY as asymptotes.

EXERCISE NO 8**8.1 Involute of pentagon**

Draw an involute of a pentagon of side 30mm

8.2 Involute of hexagon

Draw involute of a hexagon of side 30mm

8.3 Involute of circle

Draw involute of a circle of 60mm diameter.

EXERCISE NO.9**9.1Cycloid**

Draw a cycloid of a circle 50mm diameter.

9.2 Epicycloid

A circle of 40mm diameter rolls along the circumference of another circle of 120mm diameter from outside. Trace the path of a point on the circumference of the rolling circle for one complete revolution.

9.3 Hypocycloid

Draw a hypocycloid, rolling circle 60mm dia. and directing circle 160 mm dia.

EXERCISE NO.10**10.1 Helix of cylinder**

A point is moving around the surface of a cylinder of 60mm diameter at uniform speed and at the same time ,it advances in the direction of axis by 60mm also with uniform speed. Draw the path of moving point and name the curve.

10.2 Archimedean Spiral

1) Point P is 130 mm away from the fixed point pole O. The point P moves towards pole O and reaches the position P' in one convolution, where OP' is 22 mm. The point P moves in such a way that its movement towards fixed point O, being uniform with its movement around fixed point pole O. Draw the curve traced out by the point P. Name the curve.

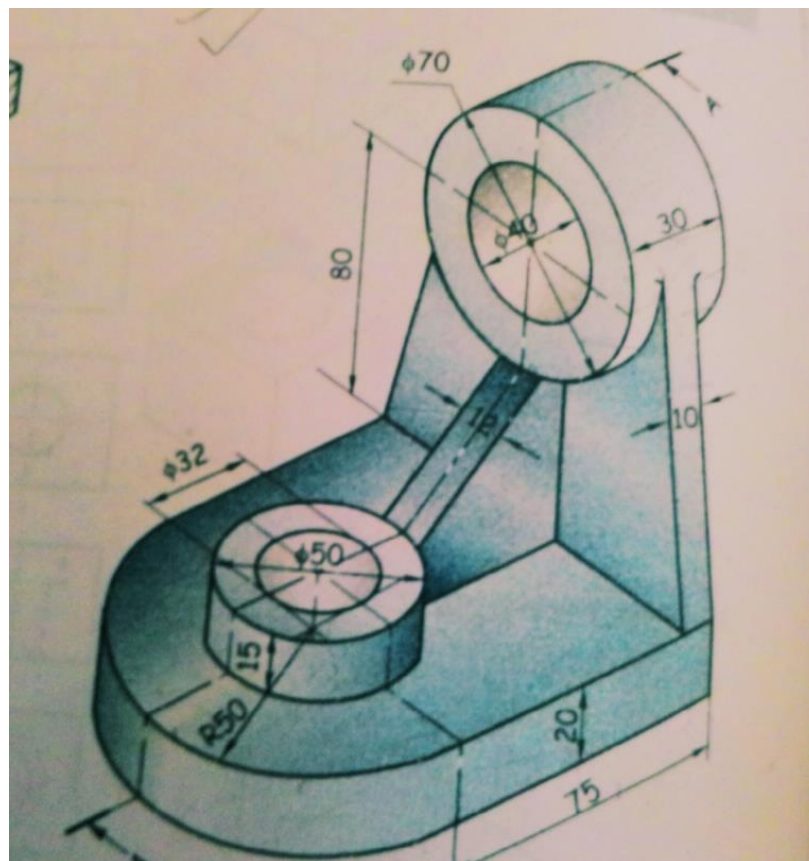
EXERCISE NO.11**11.1 Loci of points**

1) In slider crank mechanism the connecting rod AB is 120 mm long and crank rod is 40 mm long. The end B moves along the straight line passing through O. Trace the locus of point P, 45 mm from A along the connecting rod for one revolution of crank OA.

EXERCISE NO.12

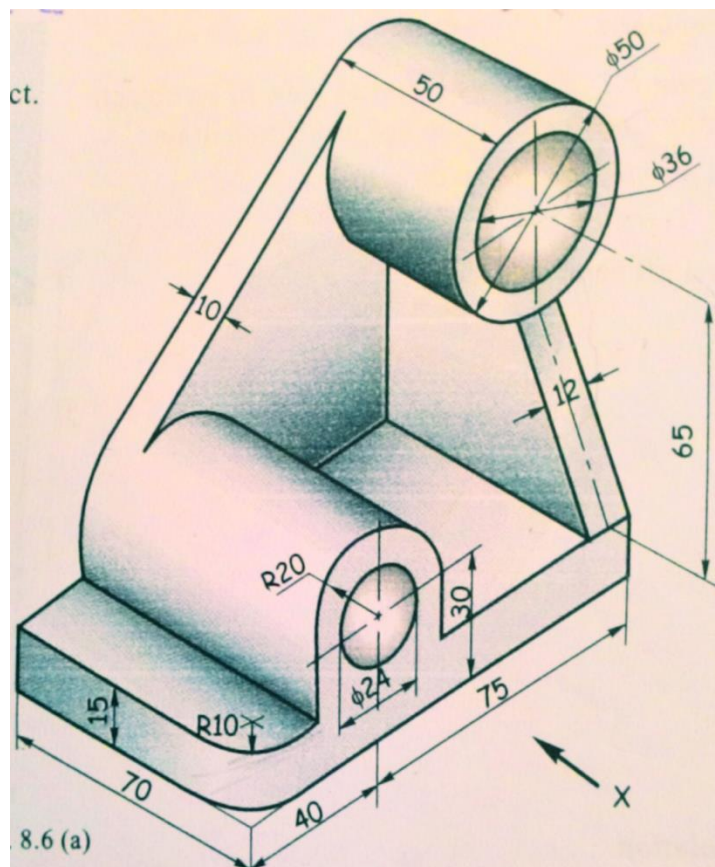
12.1 Using first angle method of projection

Draw 1)F.V looking in direction of x, 2)T.V,3)S.V



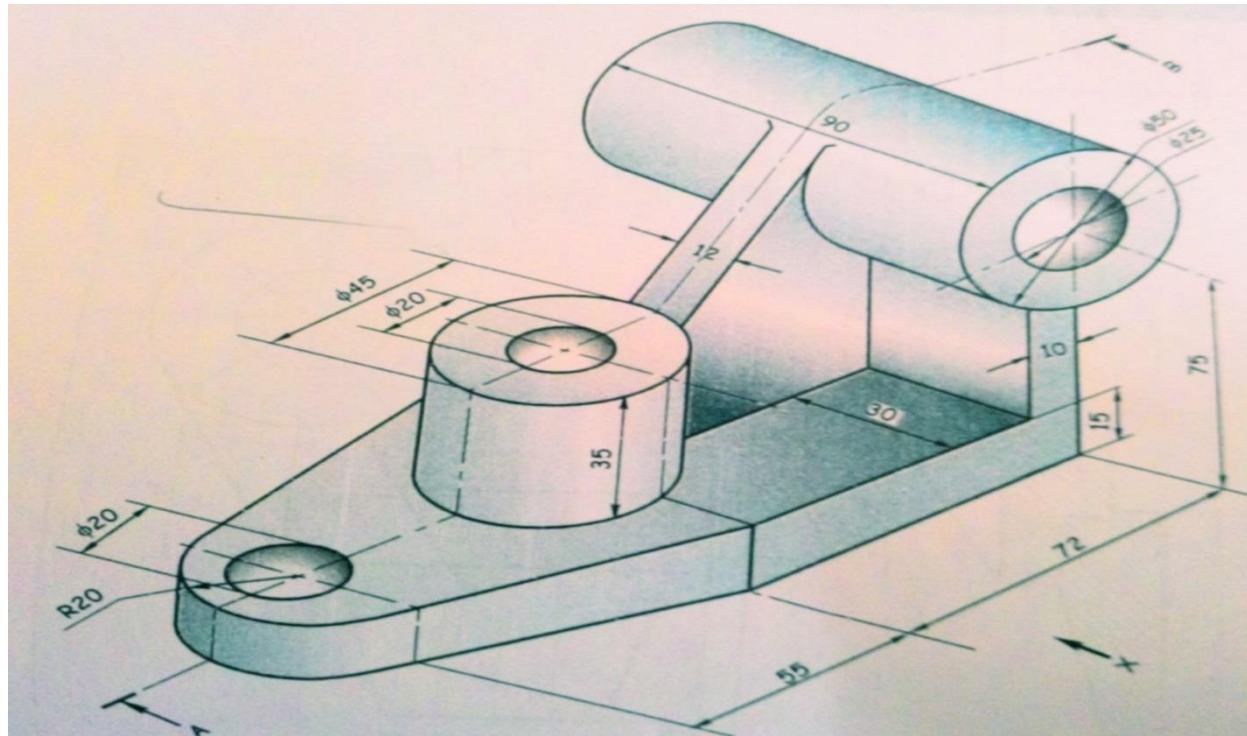
Conversion of pictorial view into orthographic view

12.2 Using first angle method of projection, Draw 1) F.V looking in direction of 2) T.V 3) S.V



12.3 Using first angle method of projection, Draw:

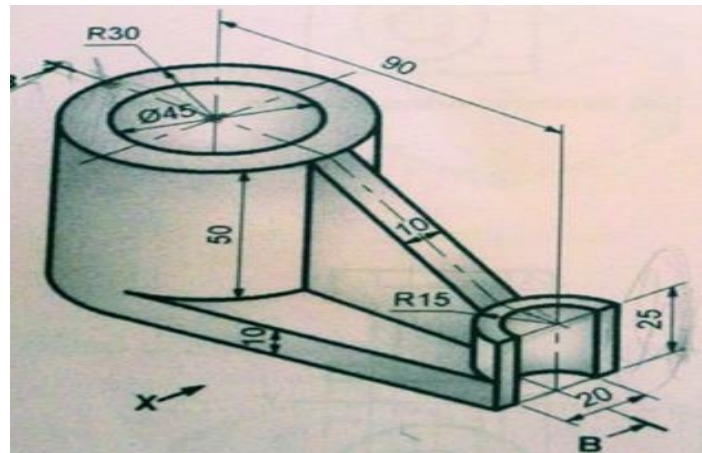
- 1) F.V looking in direction of X
- 2) TV



12.4 Drawing of sectional view

Fig. shows pictorial view of an object .Using first angle method of projection

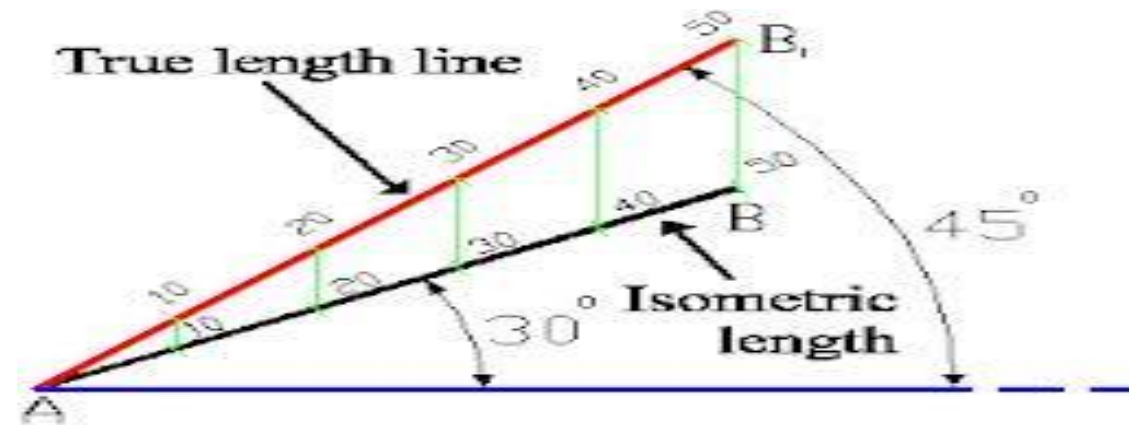
Draw 1) F.V in direction of x(Section A-A)2)T.V



EXERCISE NO.13

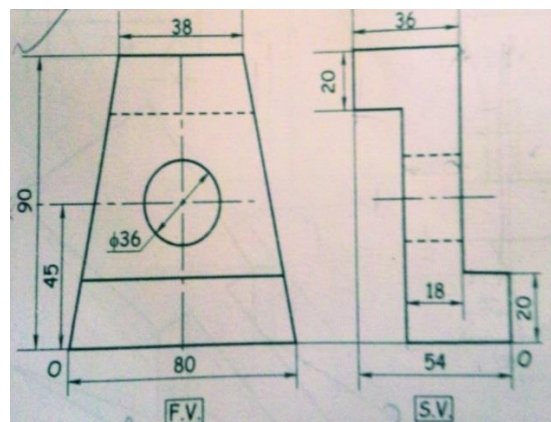
Conversion of orthographic views into isometric View/projection

13.1 ISOMETRIC SCALE

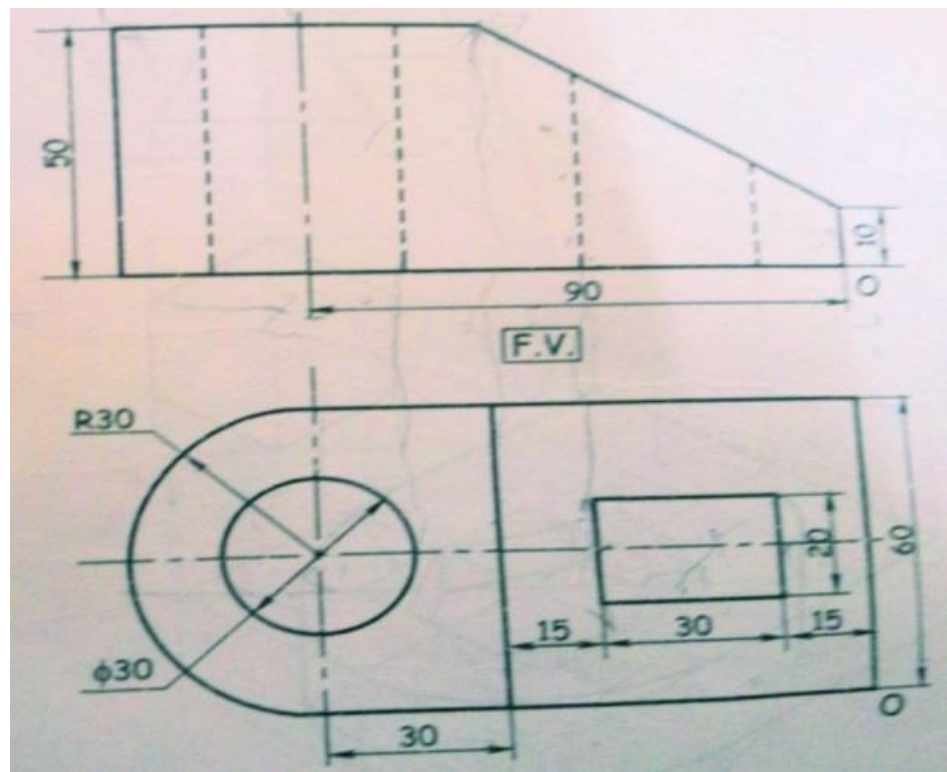


$$\text{ISOMETRIC LENGTH} = 0.816 * \text{TRUE LENGTH}$$

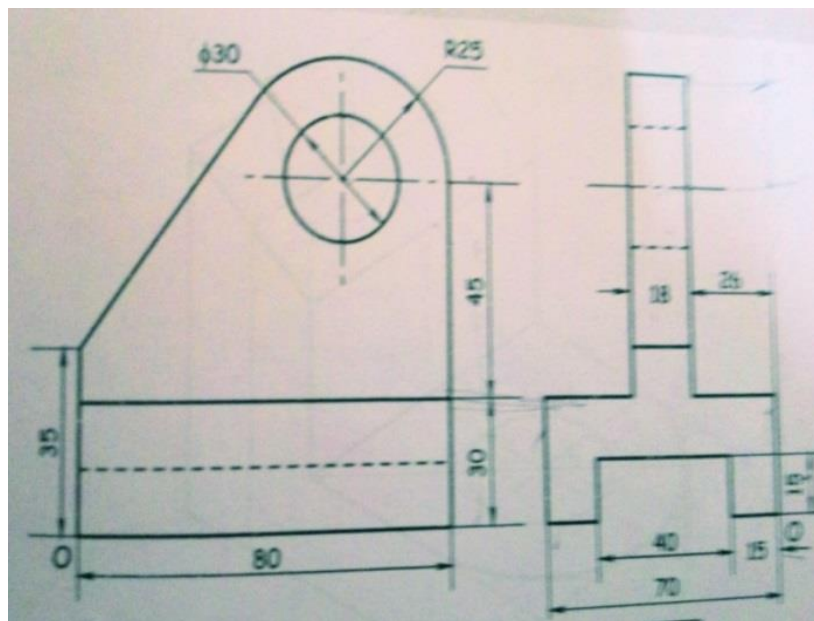
13.2 Figure shows front view and side view of an object. Draw its isometric projection about origin O.



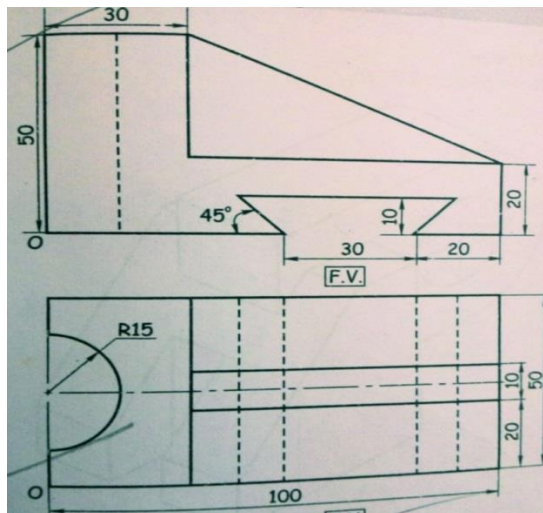
13.3 Figure shows front view and top view of an object. Draw its isometric projection about origin O.



13.4 Figure shows front view and side view of an object. Draw its isometric projection about origin O.



13.5 Figure shows front view and top view of an object. Draw its isometric projection about origin O.



EXERCISE NO.13

Draw free hand sketches/conventional representation of machine elements such as thread profiles, nuts, bolts, studs, set screws, washers, locking arrangements.

