

# Drawing

## Concept Drawing

(ii) construction of  $\Delta ABC$

(MF) . As Built Drawing

# Engineering Drawing II Most imp. in paper

- (2) panel
- (3) Instrument

## Paper!

air aspect ratio

X : Y

210 x 29+

210 : 297

$$210 : \sqrt{2} (210.)$$

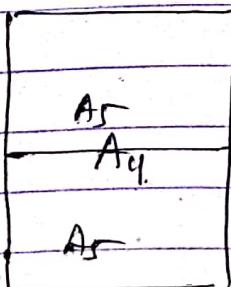
$$1 : \sqrt{2} \quad \#$$

100

4.29.7

X: 210

$\text{gm/mm}^2$



$$A_5 = \underline{A_4}$$

$$A_5 = 148 \times 210$$

4y- 210x 297

$$A_3 = 297 \times 420$$

$$A_2 = 420 \times 594$$

$$A_1 = 594 \times 841$$

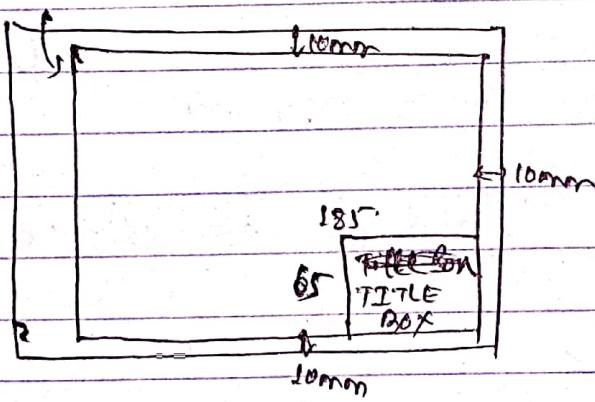
$$A_0 = 842 \times 1189 \text{ (1m}^2\text{ area)} -$$

\* Rough surface  $\Rightarrow$  concept drawing  
 $A_2$   $A_3$  and  $A_4$   $A_3 = ? A_4$

① Remodel 2 upper difference

$$2^{4-3} = 2 \\ A_0 = ? A_4 \quad 2^{(4-0)} = 2^4 = 16 A_4$$

Drawing  $\Rightarrow$  mm (cm<sup>t</sup>)  
 min 25mm



### TITLE Box

Designed, checked, approved  
 Heading, Date, cm<sup>t</sup>  
 Angle projection, symbol  
 scale  
 texture (alphabet height)  
 width = 5mm  
 height = 7mm

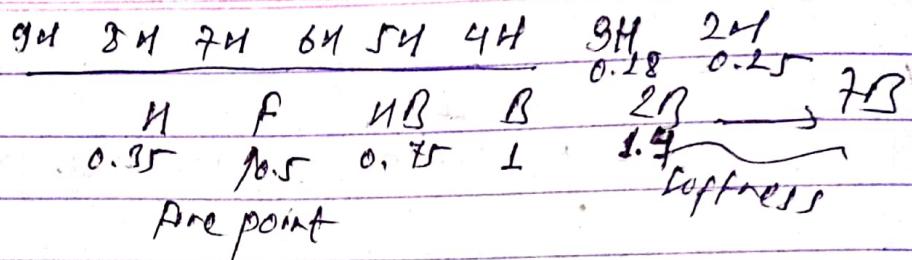
Border line  $\Rightarrow$  protection of drawing (prevents fire)  
 To prevent drawing from spoiling!  
 Relative humidity  $\leq 40\%$ .

$$T \leq 20^\circ\text{C}$$

Draft.: Shape hexagonal for superior grip.  
 wooden dust

Drafting tools

Start : Mechanical sketch pencil  $\Rightarrow$  sharpening required  
 Hard



HB pencil with uniform pressure

Multiplying factor  $\sqrt{2}$       Eg:  $0.12 \times \sqrt{2} = 0.25$   
 $0.25 \times \sqrt{2} = 0.35$

A) chisel shape  $\rightarrow$  long thin lines of uniform thickness  
 so used in drawing quantity.

B) conical shape (soft pencil)  
 $\rightarrow$  used in sketch work and lettering

### Lines :

(1) Solid visible line  $\Rightarrow$  dark and continuous

B, 2B

(2) Hidden line  $\Rightarrow$  or dark fine or dot line

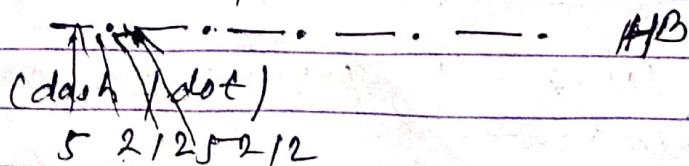
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$\Rightarrow$  discontinuous and dark. B

5mm ~~and~~ 2mm gap  
 dash

ratio 1:2  $\Leftarrow$  gap : dash

(3) center line / chain line

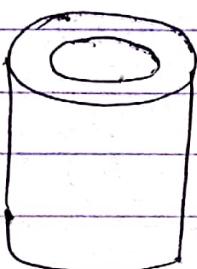


Chisel shape  $\Rightarrow$  rubbing the lead on a sand paper  
 Cornual shape  $\Rightarrow$  rotating the lead between thumb and fingers.

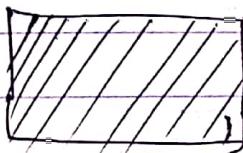
(iv) Cutting plane line or,



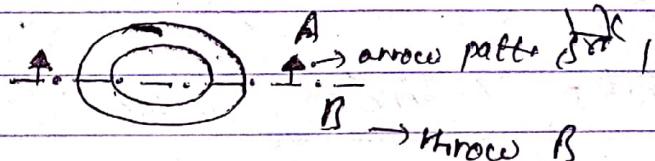
Section line



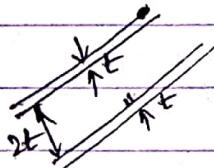
(v) Matching line etc



$45^\circ$



HB pencil hatching



(vi) Projection / construction / guideline  
 $\Rightarrow$  contours and faint

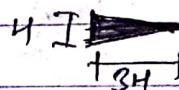
Hor 2x  
or 4x

(vii) Dimension line

come together



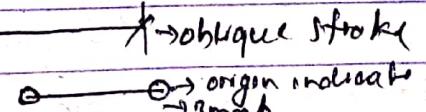
Aspect ratio of arrow head



~~3:1~~

or oblique stroke

Extension or



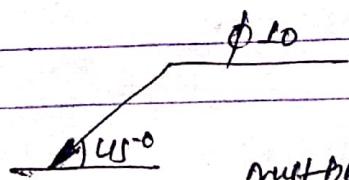
origin indicates

3mm

200 10mm (or 1m)

for feature height  $\oplus$  ~~2~~

(viii) Leader line



$45^\circ$

middle  $75^\circ$

$\rightarrow$  link with ~~feature~~ features.

dot if within outline of object

if at  
cyclic  
anion

(c)

no arrows or dots  
on diagram  
done

(41)

Break lines. (leader box)

### a) Long Break line

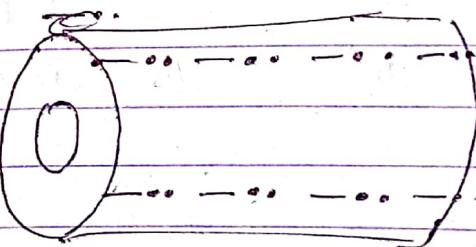
$\Rightarrow$  short-circuited cross-section

## b) Short Break Line

5) ~~united~~ enclosed section

Phantom line:

⇒ indicate motion.



~~521252125~~

A handwritten musical diagram showing a sequence of chords and their voicings. The diagram includes the following elements:

- Chords:** AB (inverted), X (inverted), and F major.
- Voicings:** A 2nd inversion voicing for AB is shown above the staff, and a 1st inversion voicing for F major is shown below the staff.
- Labels:**
  - "copy" points to the 2nd inversion AB voicing.
  - "invert action copy" points to the 1st inversion F major voicing.
  - "Bass" points to the bass line under the F major chord.
  - "drop" points to the bass line under the F major chord.
- Handwritten Text:** "2", "5", and "2" are written vertically along the left side of the staff.
- Staves:** Two staves are shown, with the bottom staff being the bass staff.

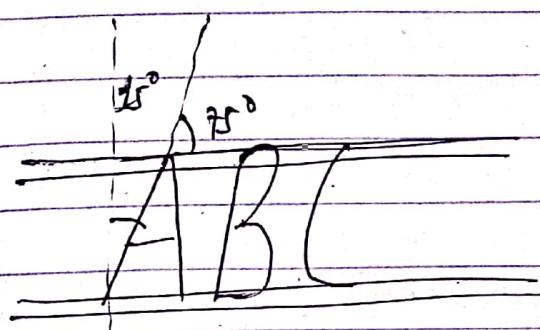
Height of roller (7mm) Aspect ratio of alphanet 5:7

letter to letter gap = 2 mm

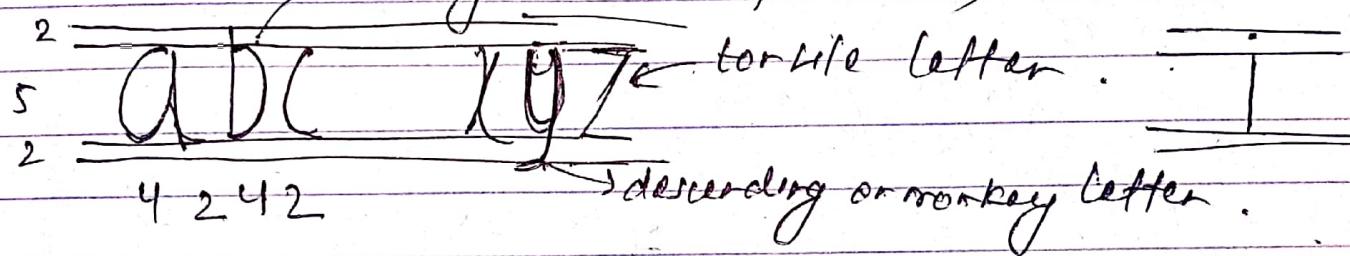
word to word gap = 7 mm

centered to sentence.

sentence fo sentence =  $2 \times$  height of letters = 14  
(from full stop).



slant angle =  $15^\circ$  + inclined angle =  $75^\circ$  =  $90^\circ$   
ascending letters (cursive letter)



Aspect ratio .

a) 4:5

b) 4:2 depends on letter

c) 5:7

a  $\Rightarrow$  4:5 b  $\Rightarrow$  4:7 c  $\Rightarrow$  1:5

## # Instruments / Drafting Equipment .

Drawing Board

$$D_0 = 25 \times 1000 \times 1120$$

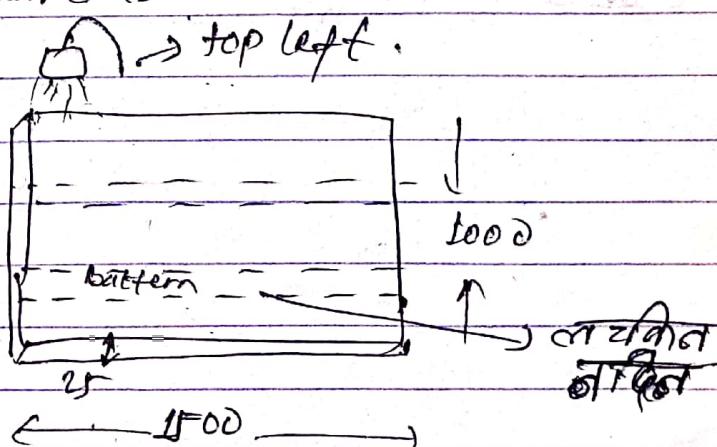
$$D_1 = 25 \times 700 \times 1000$$

$$D_2 = 15 \times 500 \times 700$$

$$D_3 = 15 \times 350 \times 500$$

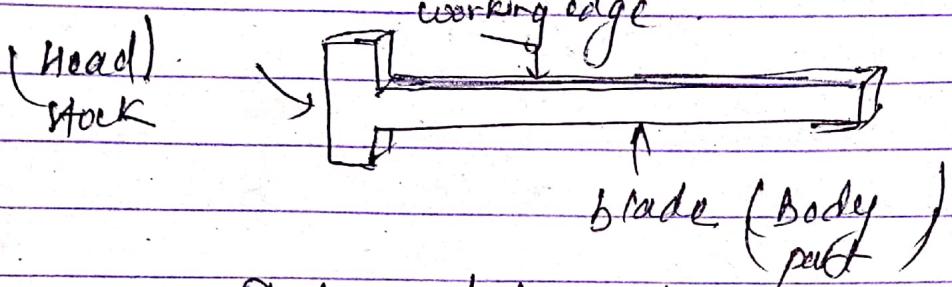
(250)

counting  
edge



Oak / pine wood  
 $\Rightarrow$  well seasoned soft wood .

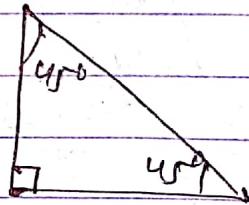
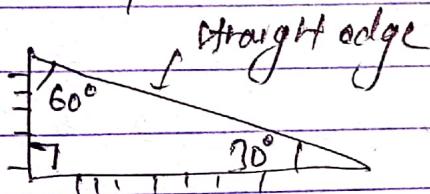
## ① T-square :



Flat and triangular, transparent.

$\Rightarrow$  only for horizontal line.  $\Rightarrow$  a base for set-squares

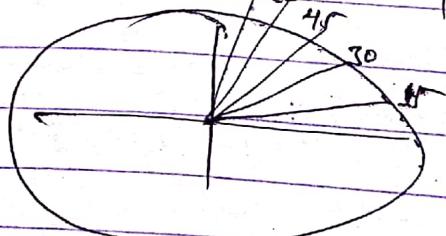
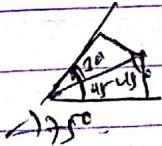
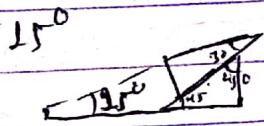
## ② set-square



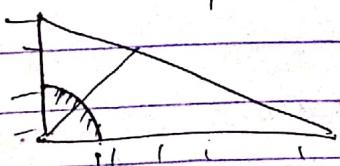
$\Rightarrow$  used to draw  $\parallel$  lines and straight lines except  $\text{horizontal}$

$\Rightarrow$  flat and triangular

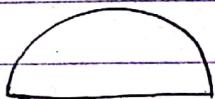
$\Rightarrow$   $15^\circ$  offset  $\parallel$  line with  $15^\circ$  angle



Adjustable set-square  $\Rightarrow$  aka diagonal h



### (iii) Protractor



=> flat and triangular

=> angle measurement

=>  $10^\circ$  interval

size depends on

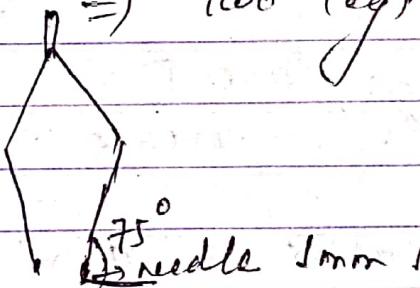
a) R

(b)  $\phi$

(c) Base

(d) round

### (iv) compass (Bow):



=> two legs

$R \leq 10\text{ mm}$  very small circle  
=> Drop compass

needle 1mm longer.

$R > 125\text{ mm}$  => very large circle  
~~100 mm~~

=> lengthening ~~leg~~  $> 15\text{ mm}$   
attached to compass circle

$10 < R < 125$  => bow compass  
small circle

### (v)

#### Divider:

=> two legs equal

=> non move

=> length of section transfer.

# Engineering Drawing.

Standard curve

center & Radius of each curve.

## Instrument

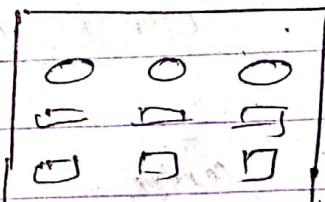
Arcs curve

- irregular curve joined smoothly
- no marking done
- flat and triangular

Tscale is more precise than Drapier

Erasing ~~sheet~~, shield

to erase just specific parts of the drawing



protection

→ may be opaque or transparent.

Eraser:

- made of (a) rubber (c) plastic
- (b) gum (d) ~~Antigum~~

I Sharpeners

(iii) Sand Paper

(iv) ~~Cutter~~  
Pencil sharpener

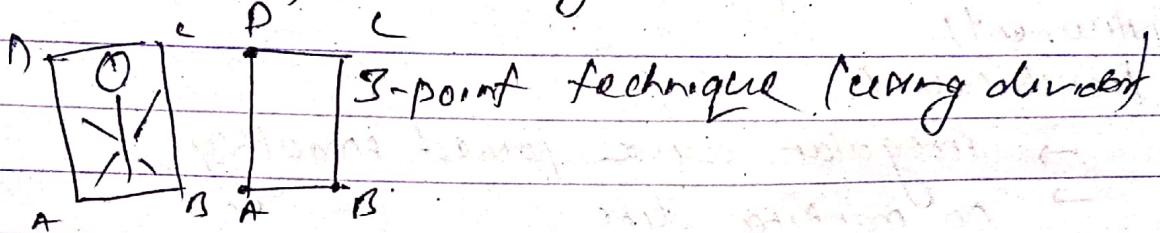
II Paper Tape:

III Base paper: (Outer side of front)

IV Tracing paper

compost, cotton hankie, etc.

How to transfer drawings:

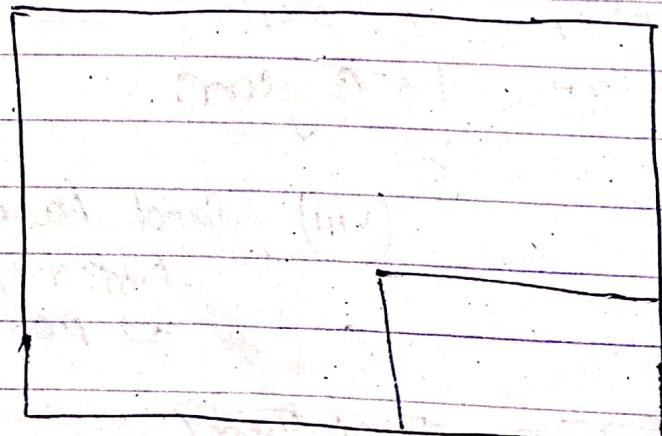
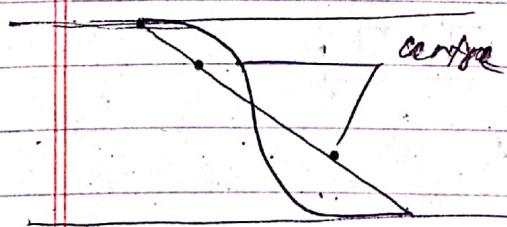


# Is ogee curve a standard curve?

=> Yes Two centers and at most

two ~~radii~~ (radii). If sym. only one radius

ogee curve used in speed breakers



landscape mode.

More informative:

Tentative  $\Rightarrow$  to provide information.

Dimension:

Two ways:

a) Align system

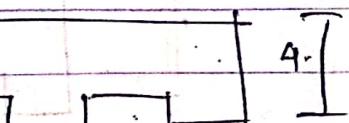
$\rightarrow$  above horizontal line

$\rightarrow$  vertical line  $\rightarrow$  left or right

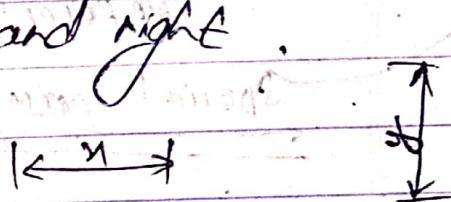
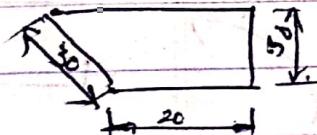
$\rightarrow$  to readable from bottom and right

$\rightarrow$  reduced drawing  $\xrightarrow{\text{scale}}$  file

$\Rightarrow$



120 + 30 = 150

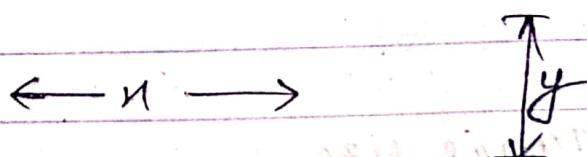


b) Uni-directional system:

$\rightarrow$  readable from bottom only

$\rightarrow$  normally used in enlarged scale

$\rightarrow$  computer screen  $\xrightarrow{\text{size}}$  are  $\xrightarrow{\text{large}}$

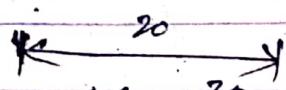


Dimension Line Type

(a) Chain Type:

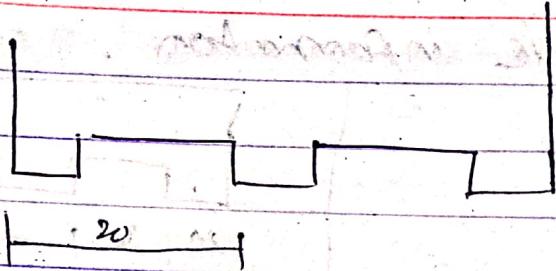
$\rightarrow$  possibility of error accumulation

(b) Parallel Type:



$\Rightarrow$  no error accumulation

note: system  $\rightarrow$  system and  $\xrightarrow{\text{size}}$  of  $\xrightarrow{\text{size}}$   
Type - Type of  $\xrightarrow{\text{size}}$   $\xrightarrow{\text{size}}$



Referential system

Special case of parallel

Note

\* Diagonal system (not above category)

IF  $\infty$ , seen in practice

Scale:

image size

object size

IF written in practice (diagonal scale)

$\Rightarrow$  representation (RF), factor

IF written as  $1:10$  or  $\approx$  scale

IF  $RF < 1 \Rightarrow$  reducing ~~factor~~ scale  
Canting, reduction

IF  $RF > 1 \Rightarrow$  enlarge scale

(computer) (biology, etc)

If RF = 1  $\Rightarrow$  Full-scale (actual measurement)  
(width & area)

Note: scale is always in linear measurement.  
(1 dimension fit)



$$10000 \text{ cm}^2$$

$$10^6 \text{ mm} \times 10^6 \text{ mm}$$

$$10^6 \times 1000 \times 1000$$

$$100 \text{ km}$$

$$100 \text{ km}$$

$$1 : 10^6$$

$$10^6 \times 1000 \times 1000$$

$$1 : 10^6$$

~~scale~~ =  $\frac{I}{O}$

$$100 \text{ mm}^2$$

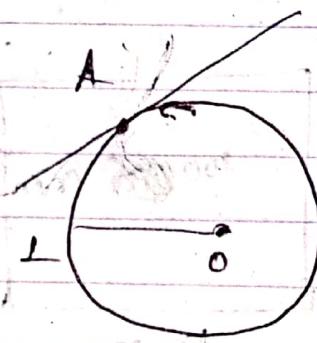
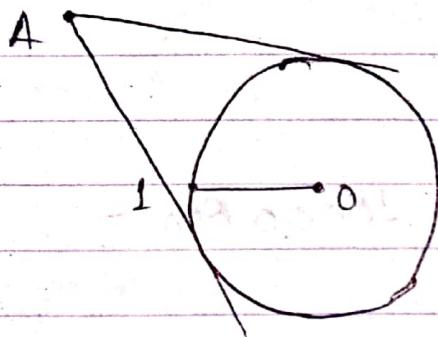
$$10000 \text{ km}^2$$

$$1 : 10^6$$

~~volume~~  $\Rightarrow \sqrt[3]{}$

If scale is doubled area occupied  
 $= 4 A_0$

\* Geometrical construction :  
Line Tangent.

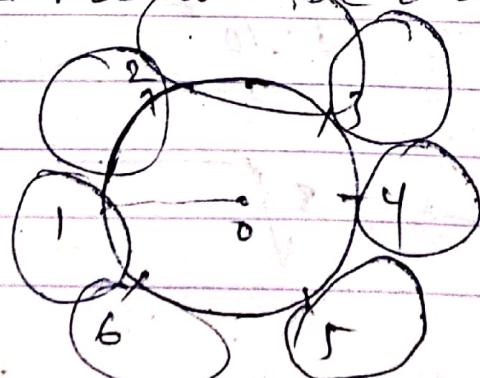


(i) Any point A outside the circumference  
=> two tangents possible

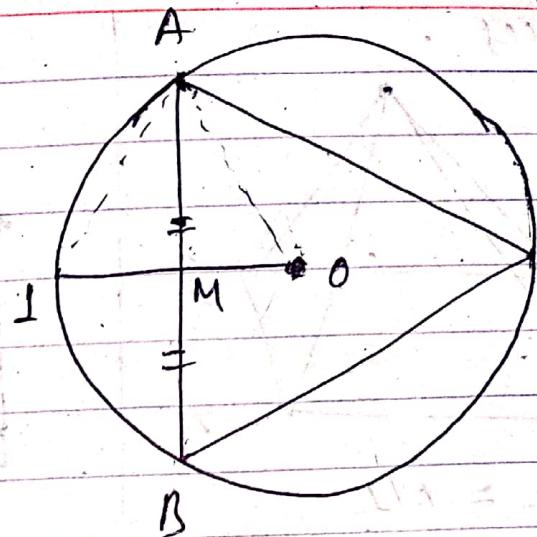
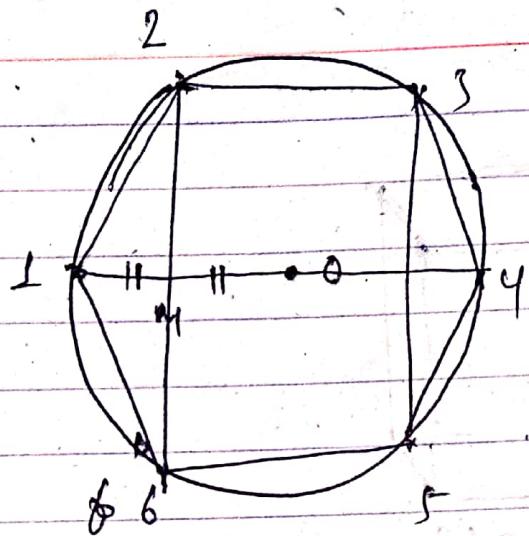
(ii) A on circumference  
=> only one tangent

III Are tangent

In a circle maximum 6 are tangent  
of same size can be drawn.



$$ON = NL$$



~~if AM taken  
and circle  
cut into  
equal parts  
then  
heptagon  
friday.~~

$$B_0 \quad 01$$

$$AM \quad 01$$

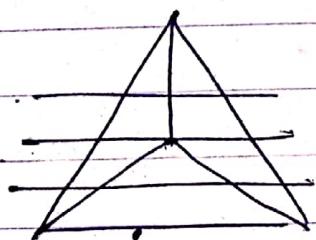
$$AM \quad OA$$

$$\frac{\Delta}{\text{Heptagon}} = \frac{AB}{AM} = \frac{2AM}{1AM} = 2:1 \quad AM = \sqrt{OA^2 - OM^2}$$

Eq.  $\Delta$  inside a circle and a heptagon - draw  
area ratio of sides are  $2:1$   $\Delta$ : heptagon

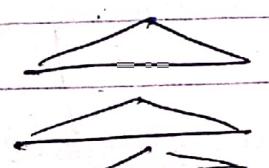
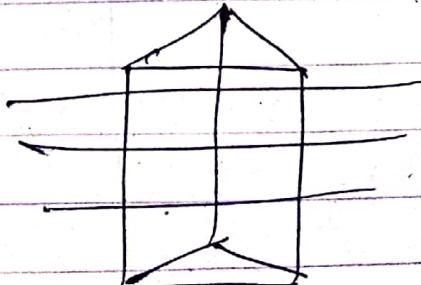
\*

Pyramid



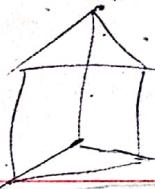
changing  
size but  
shape  
shape

Prism

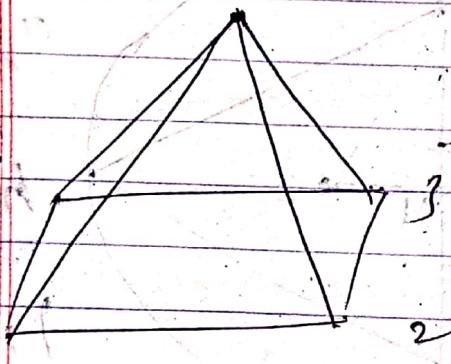


shape shape  
and size

of X section  
along the  
object.



Face



$$\text{Face} = n \times l \\ = 4 \times 1 = 4$$



$$= n \times l \\ = 6$$

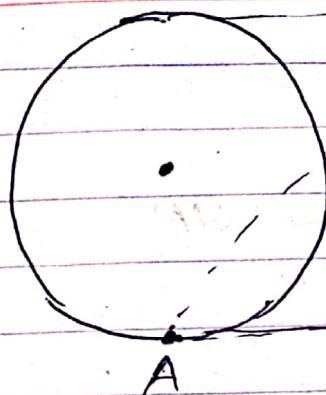
Edge =  $2n$

$$= 2 \times 4 = 8$$

Edge =  $3n$

$$= 3 \times 4 = 12$$

cycloid .



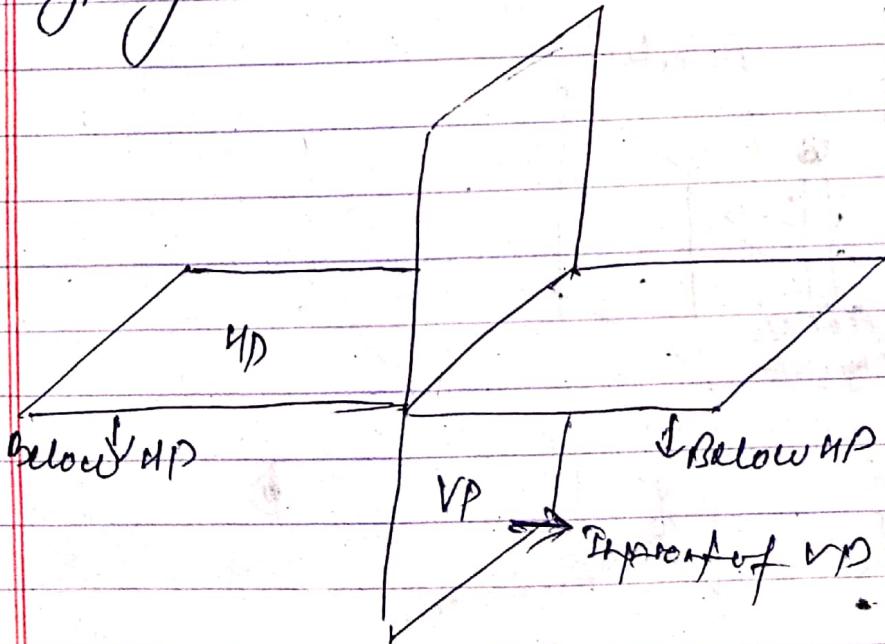
⇒ cycloid

Epicycloid ⇒ Outer circle starts cycle first after inner circle has rotated about A or orbit path curve .



Hypocycloid :- "

" Path of M18G )



Shade and shadow ?

↓  
area occupied .

12 PM

Shade and shadow are same .

Planes are assumed transparent.

Back view: 6 basic views

(i) 1st Quadrant:

Front of VP and above HP

(ii) 2nd Quadrant:

Behind VP and above HP

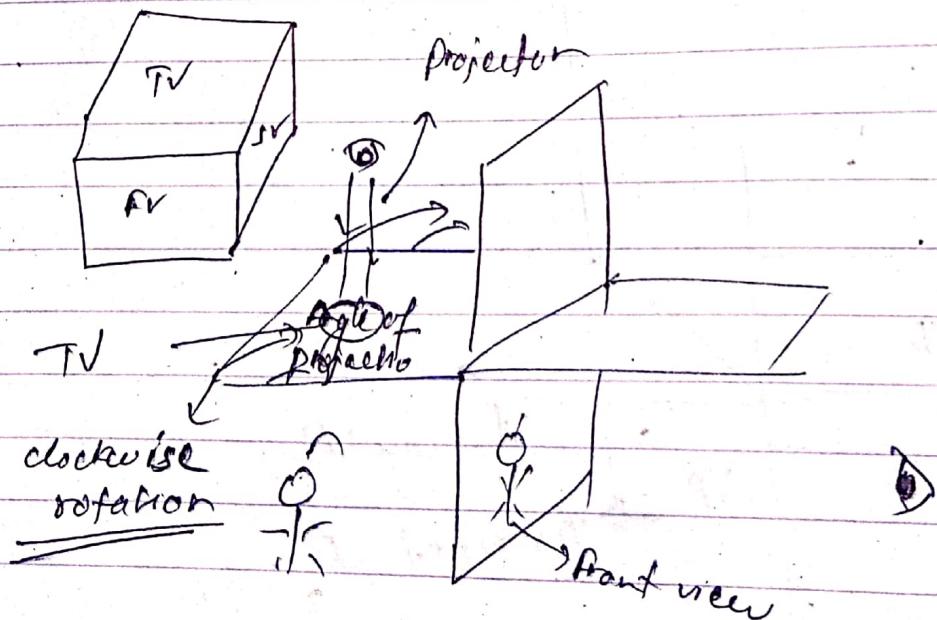
(iii) 3rd Quadrant: below

Behind VP and ~~above~~ HP

(iv)

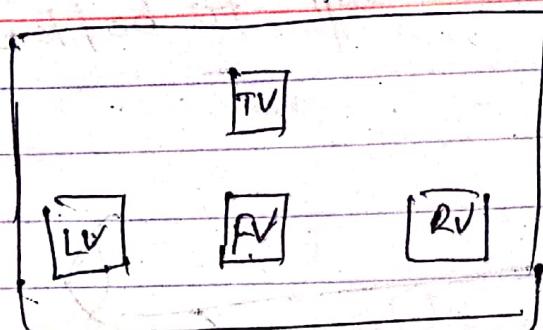
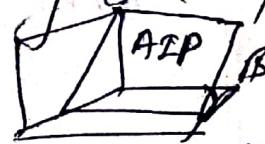
4th

Front of VP and below HP



Projector lines are ~~area~~  $\parallel$  to each other and  $\perp$  to the plane

Auxiliary Plane  $\rightarrow$  when opposite to convey cell in position  
 an additional plane introduced  
 $\rightarrow$  conveys true length



3rd angle projection.

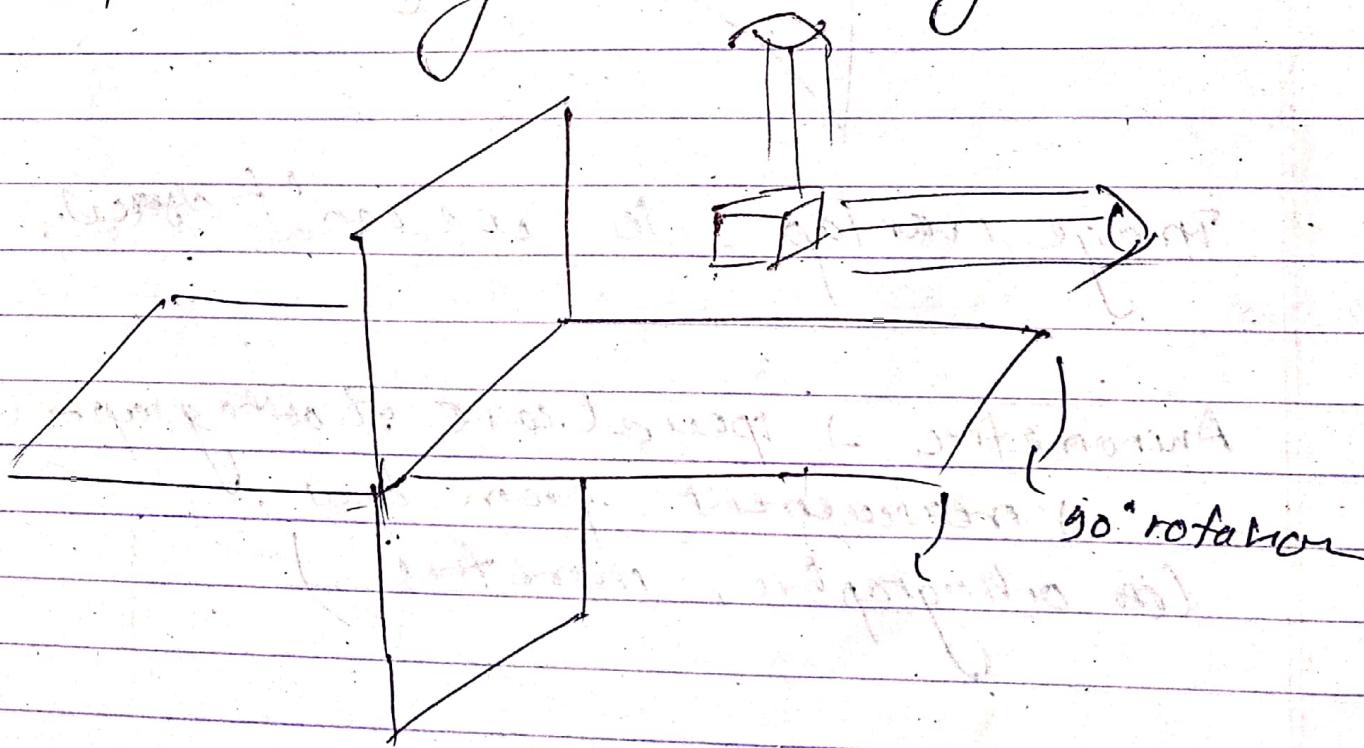
Nepal, America, India  
 (3rd Angle)

Auxiliary VP  $\Rightarrow$  far to horz<sup>2</sup>  
 inclined with VP

Auxiliary inclined far to  
 plane  $\Rightarrow$  vertical  
 (AIP) inclined to horz<sup>2</sup>

European drawing  $\Rightarrow$  a 1<sup>st</sup> angle

Overall



1<sup>st</sup> Ang 6

1<sup>st</sup> angle w/ object & front

RSV	FV	LSV	while third angle by image or place object
X	TV	X	

BD. Envelope shot from 3D view.

Behind  $\Rightarrow$  tilted image / right to left  
Top to bottom.

2nd quad.

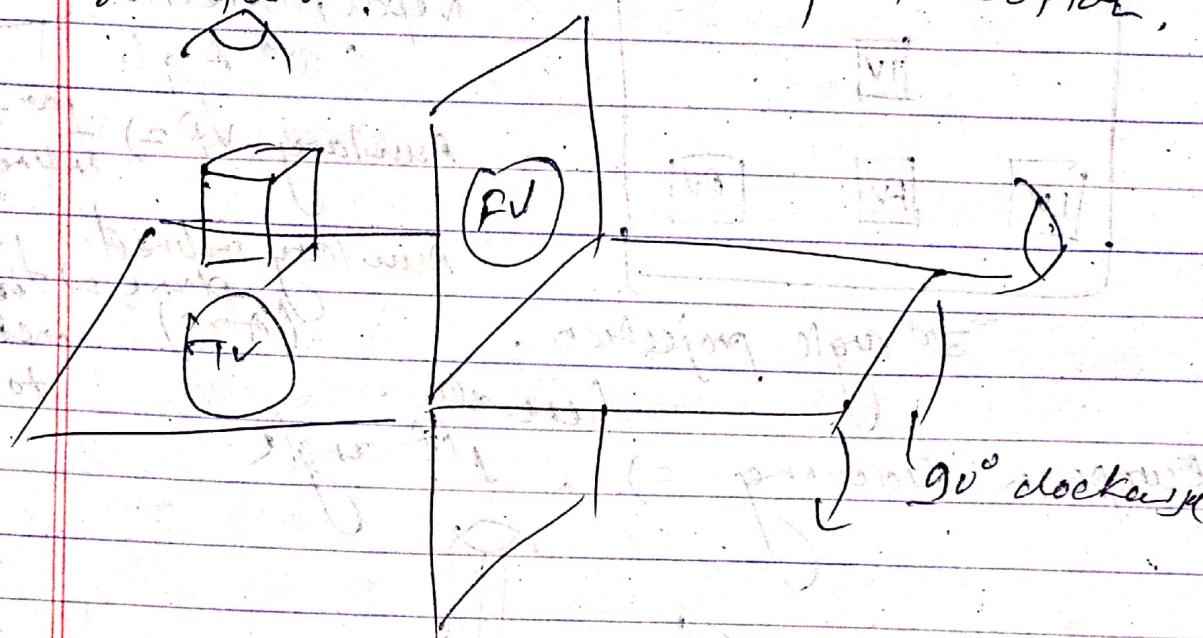


Image overlap: so we can't choose.

Anisometropic  $\Rightarrow$  special case of orthographic.

$\Rightarrow$  measurement from axis.

( $\Rightarrow$  orthographic, isometric)

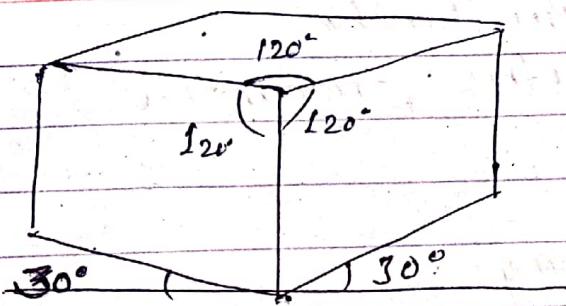
# Isometric Drawing:

$\rightarrow$  can't be drawn in real  
 $\rightarrow$  Vanishing points & information. Not  
P / G/R/T/S!

$\rightarrow$   $30^\circ / 30^\circ / 30^\circ$  inclined planes

$\rightarrow$  also anisometric as measured  
from axis.

$10^\circ$  shown as  $120^\circ$   
measurement taken as if it

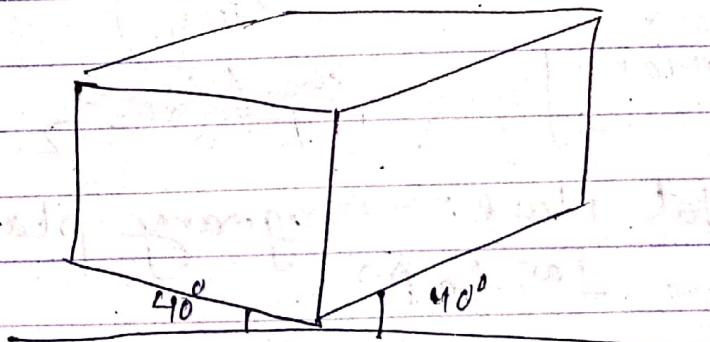


Projection will size in a circle /

$$\frac{\sqrt{2}}{\sqrt{3}} = \frac{2}{\sqrt{11}} = 0.815 \Rightarrow \text{Isometric projection}$$

\* Diametrical drawing:

- any two angles made by faces are same
- $40^\circ / 40^\circ / 30^\circ$



\* Isometric

All different

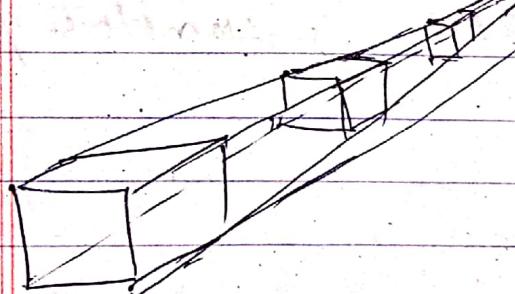
$50^\circ / 50^\circ / 50^\circ$  ?

→ diametrical (Cary two same)  
So,

Manufacturing IT use  
beamline  
Photometric, diametrical, triametrical

\* Perspective Drawing:

→ Picture plane IT Image ~~size~~  
vertical, transparent



Horizon cone of vision  
 $60^\circ$

vertical  $\Rightarrow 45^\circ$

Angle of vision vertical  $\Rightarrow 45^\circ$

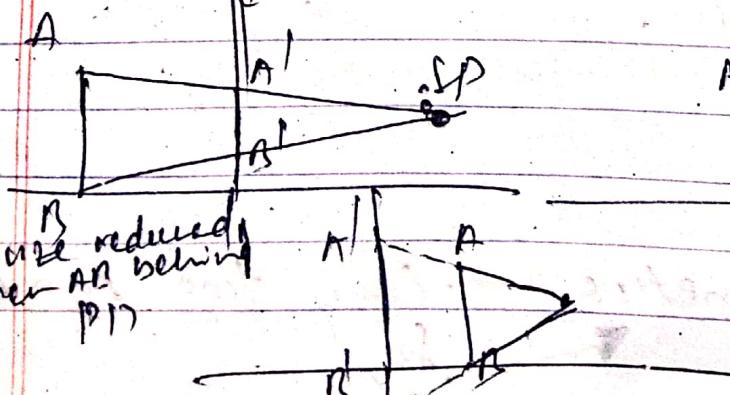
" " horizontal  $\Rightarrow 30^\circ - 60^\circ$   
(approx.)

cone of vision

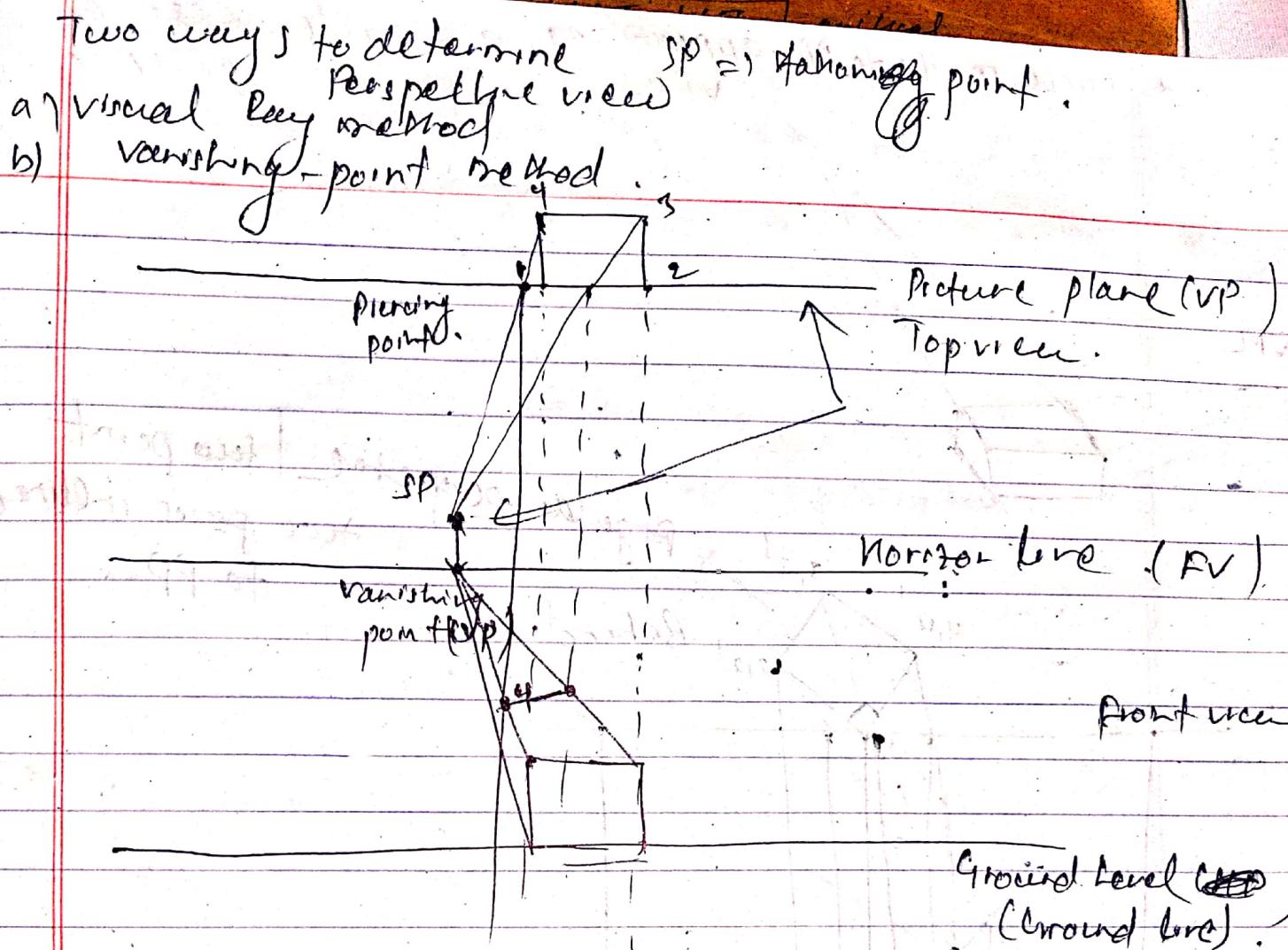
base  $[30^\circ]$

horizontal plane: - imaginary plane at eye level. Far fo. PP

Horizon line: line in which horizon plane intersects the PP: // ground line



Same image when at M  
infront of PP



one vanishing point  $\rightarrow$  one / Parallel perspective  $\rightarrow$  one or more face of object parallel to PP  
 and one or more face  $\parallel$  to  
 Because object Picture plane  $\not\parallel$  PP

when do we use one perspective?

$\Rightarrow$  ① ~~one point perspective~~ wall description

room  $\rightarrow$  two point perspective

location of SP  $\Rightarrow$  a great importance.

For buildings, SP taken at normal person height  $\approx 1.8 \text{ m}$

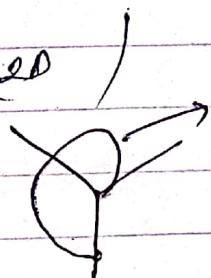
Distance bet<sup>n</sup> SP and PP  $\geq 2$  \* greatest object dimension.

Angular Perspective / Two point  $\Rightarrow$  two planes inclined to PP

Oblique Perspective / 3 point = ~~all~~ 3 planes inclined to PP.

$\Rightarrow$  w. 2 point by both circ. eng. and architect.

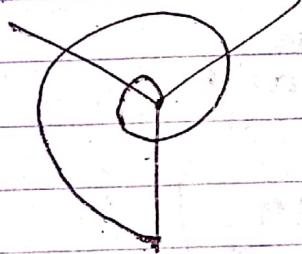
\* Spiral (2D)



Archimedean spiral

(Imagine an ant climbing up a pan blade).

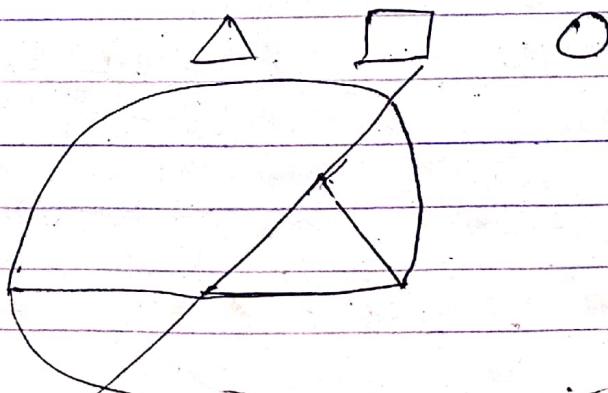
(A) 1 convolution.



2-convolution.

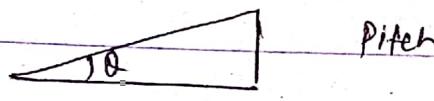
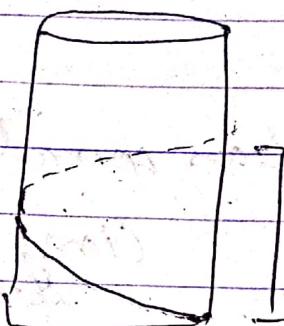
Convolution : complete rotation.

\* Involute : (2D)



Azimuth  $\Rightarrow$  Pitch.

(iii) Violin (3-D)

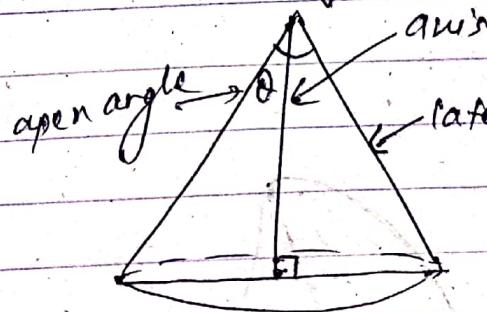


$\theta \Rightarrow$  pitch angle.

$$\theta = \tan^{-1} \left( \frac{\text{Pitch}}{2\pi r} \right)$$

#.

+ Conic section

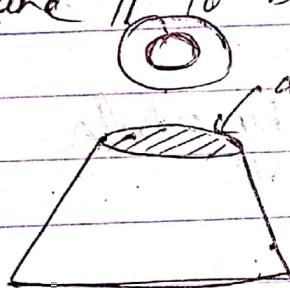


axis

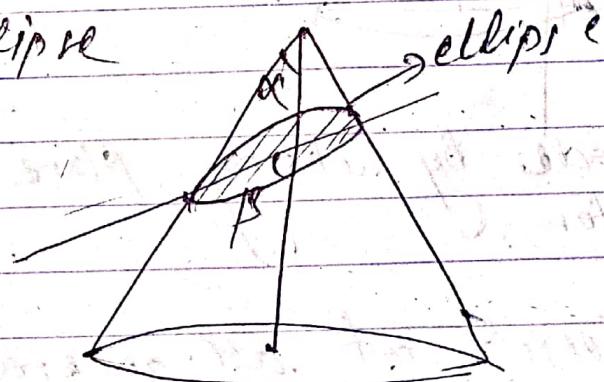
lateral line / surface generator.

Cone is also known as Nappe.

① cutting plane  $\Pi$  to base = circle ~~section~~.



②  $\beta > \alpha \Rightarrow$  ellipse

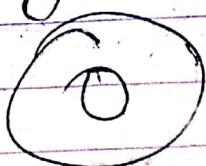
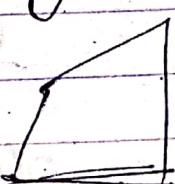


Top view  $\Rightarrow$  concentric circles.

FV  $\Rightarrow$  regular polygon

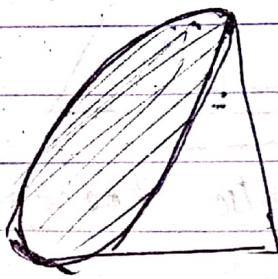
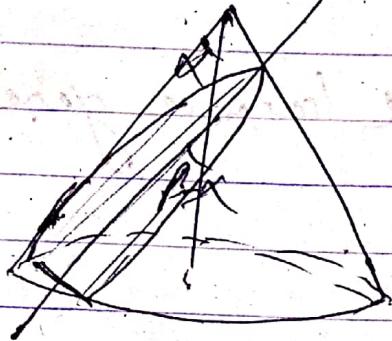


Truncated cone



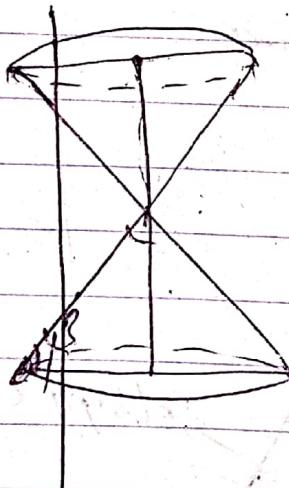
(ii)

$\alpha = \beta \Rightarrow$  parabola



(iv)

$\beta < \alpha$



$\Rightarrow$  hyperbola

$\beta =$

angle made by cutting plane w.r.t  
generator.

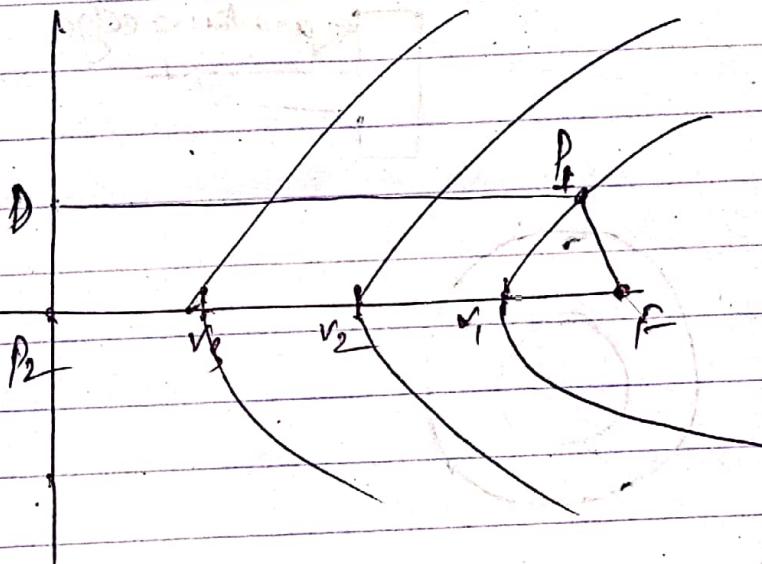
plane doesn't cut all generator  
(inclined)

Note: If plane is parallel to the axis a rectangular hyperbola is formed

If cutting plane passes through axis

a triangle is formed.

Conic section expressed in terms of eccentricity.



$$\frac{P_1 F}{P_1 D} = \text{constant} \quad \text{as } P_1 \text{ along the focus.}$$

$$e = \frac{v_1 F}{r_1 P_2} = \frac{r_1}{3n} = 1 \quad \{ 1 \Rightarrow \text{so ellipse}$$

$$e = \frac{v_2 F}{r_2 v_2} = 1 \Rightarrow \text{parabola.}$$

$$e = \frac{v_3 F}{r_3 v_3} > 1 \Rightarrow \text{hyperbola.}$$

For circle  $(e) = 0$

$$e=0 \quad e=$$

for a circle focus and locus are same.

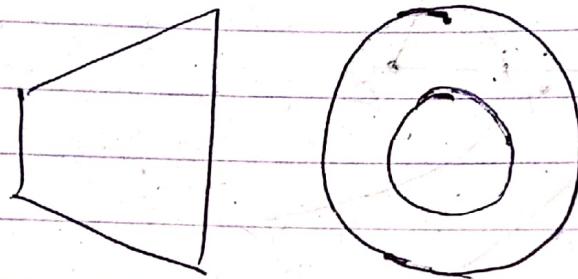
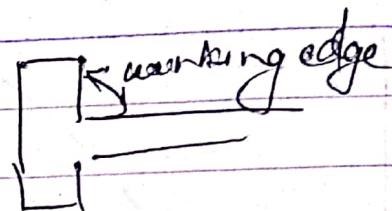
# If  $e=0$ , which is the best answer

a) circle

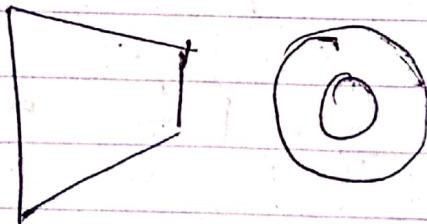
b) focus

c)

d) Point



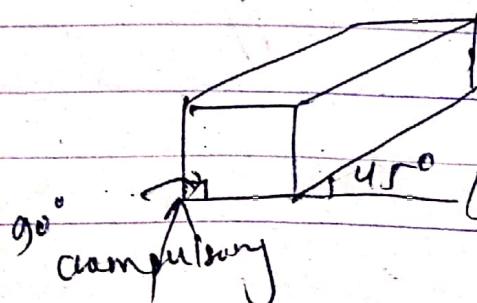
1<sup>st</sup> angle projection



3<sup>rd</sup> angle projection

\* Oblique Drawing:

→ Amometric Drawing



90° compulsory      45° (This may vary in cinematographie)

- $\alpha = 45^\circ$   $\tan \alpha = 1$
- $\rightarrow$  Cavalier Drawing ( $\alpha$  actual measurement)  
 $\Rightarrow$  no foreshortening of lines (projector)
- $\rightarrow$  Cabinet Drawing ( $\alpha$   $\approx 63.4^\circ$   $\tan \alpha \approx 2$ )  
 $\rightarrow$  industrial drawing
- $\rightarrow$  Normally for representing automobile parts
- $\rightarrow$  isometric drawing.

The scale should never be used as a — for drawing draught line.

- a) Set square      b) working edge  
✓ c) Draught edge      d) none

Thin line  $\Rightarrow$  chisel shape pencil.

For sketching  $\rightarrow$  soft pencil.

~~Drawing pen~~  $\Rightarrow$  straight lines + are (not too precise areas)

which is not a pictorial projection?

OblIQUE projection      ~~(b)~~ ORTHOGRAPHIC projection.

~~(c)~~ TRIGONOMETRIC projection      ~~(d)~~ DIAMETRIC AND NORMAFLIC PROJECTION

Projector lines are

BEST answer  $\Rightarrow$  horizontal if we rotate the plane

## Engineering Drawing

(1)

Degenerate conic is when section plane passes through

a) apex

b). base

c). between the vertex



Note: In this case:  
 a) ellipse becomes a point  
 b). parabola becomes a straight line  
 c) hyperbola becomes two intersecting lines.

### Projection

→ straight lines drawn from various points on contour of an object to meet a plane. Then the object is said to be projected in that plane.

→ a proper figure obtained by joining the lines in sequence is called projection.

→ Projector = line from object to the plane.

### \* Methods of projection

- a) Orthographic Projection
- b) Pictorial Projection

A  $\Rightarrow$  hard pencil  
B  $\Rightarrow$  soft pencil  
more clay.

Date \_\_\_\_\_  
Page \_\_\_\_\_

(2) Drawing scale of 1:25 is best used in

a) Building details b). Electrical wiring

c) Reinforcement layout d) Pipe layout

(3) Isometric view of circle is seen as:

a) Ellipse b) Hyperbola c) Parabola d) cone

Note :

Scale: a) Engineer's Scale :

1cm : 1km

b) Graphical scale: scale shrinks if drawing shrinks  
so more accurate.

$\rightarrow$  commonly used in survey maps

c) RF (Representative Fraction)

1/100, 1/200 etc.

(4) Hard pencils are best suited in

a) Building Drawings

b) Machine Drawings

c) Landscape drawings

d) colored drawing

(5) An object can be drawn by

a) Graphical method

b) sketching

c) Creating contrast

d) all



(6) As far as possible North drawings are prepared with north in the direction of

a) top of sheet

c) Right of sheet

b) bottom of sheet

d) Anywhere

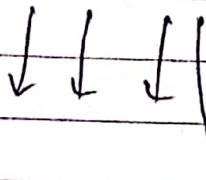
(7) Scale used for the building drawing for municipal approval is

- a) 1:100 b) 1:20 c) 1:50 d) None.

## Projection Types

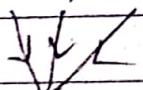
### Parallel Projection

- projectors  $\parallel$  to each other

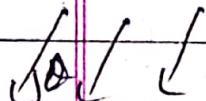


### Perspective Project

- projectors not  $\parallel$  to each other intersect at a point

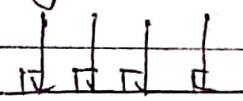


### Oblique



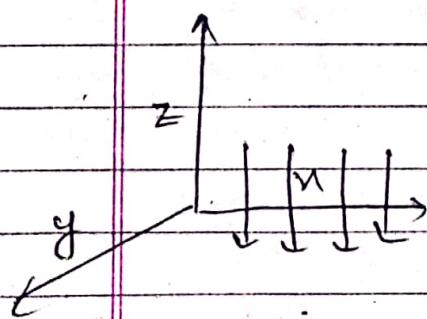
- projectors inclined to the view plane.

### Orthographic



- projectors make  $90^\circ$  with view plane.

### Multi-view



- lines  $\parallel$  to each other

- $90^\circ$  with view plane

- $90^\circ$  with any principal axis  
or  $0^\circ$  with any principal axis

### Anametric

- direction of projection line is not parallel to any principal axis.

- lines  $\parallel$  to each other and  $90^\circ$  with view plane

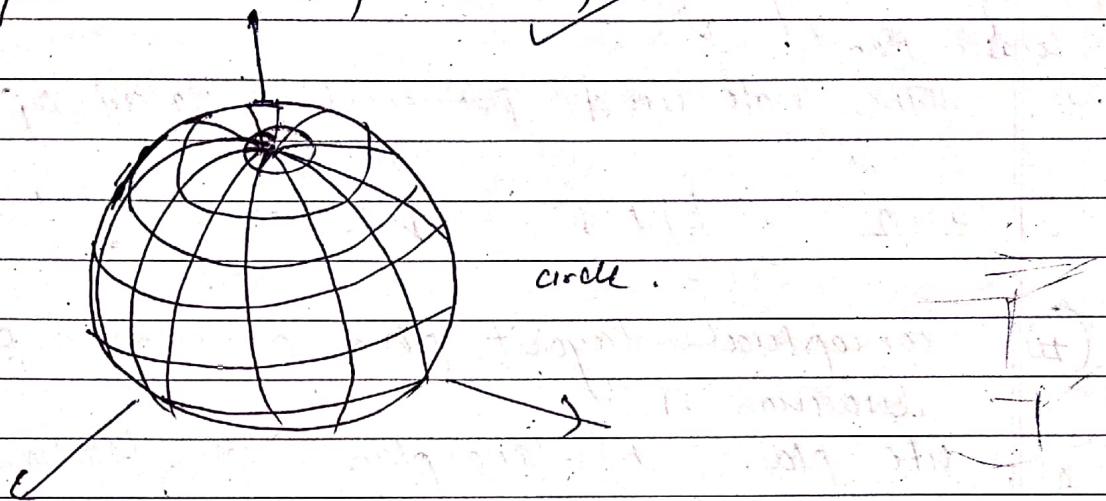
But

- Isometric (angle with all axes  $x, y, z$  same)

- Dimetric (two angles same)

- trimetric (all angles diff.)

- # Isometric view of a sphere is  
 a) An ellipse      b) A sphere      c) a circle      d) a cone



- # Comparing with isometric drawing the advantage of oblique projection is

- a) front face is in true shape  
 b) two axes always fair to each other  
 c) receding axes is taken at convenient angle  
 d) all

- # In isometric view which contains a large number of non-isometric lines which method is used

- a) bon method.      b) offset method      c) coordinate method  
 d) centre layout method

- # Dimension lines in building drawings are marked with

- a) arrows      b) fraction dots (c), arrows or tick  
 d) arrows or dots

- HB  $\Rightarrow$  for lettering & dimensioning, free sketching  
 U  $\Rightarrow$  visible outside edges, boundary  
 2D  $\Rightarrow$  dimension lines, leader lines, hatching lines

(#) Site Plan usually shows the extent of

- a) surrounding b) date c) structures d) topography  
 location plan

#. The scale used for working detail of any element

- a) 1:2 b) 1:5 c) 1:25 d) 1:100

(#) conceptual layout plan developed for preliminary discussion

- a) site plan b) line plan c) location plan  
 d) contour plan.

(#) Eraser shield is best used in

- a) hand drawn working drawing  
 b) hand drawn perspective drawing  
 c) hand drawn preliminary drawing  
 d) machine drawing (hand drawn)

# which of the following is not found in a standard set of drawing scale tools?

- a) 1:2 b) 1:5 c) 1:10 d) 1:100

	M1	M2	M3	M4	M5	M6	M7	M8
Scale on one side	1:1	1:2.5	1:10	1:50	1:200	1:300	1:400	1:1000
Scale on other side	1:2	1:5	1:20	1:100	1:500	1:600	1:800	1:2000

Note: These scales should not be used as a straight edge for drawing lines.

Note: Soft pencil for sketching & works

Hard (H or 2H) for finishing a pencil drawing  
Sharp black lines.

Date \_\_\_\_\_

Page \_\_\_\_\_

### Types of machine drawing

#### a) Production drawing

→ used by Technicians in manufacturing the parts.

#### b) Two types

##### (i) Part Detail Drawing

##### (ii) Assembly drawing

#### c) Exploded Assembly Drawing

→ detail(s) of machine in pictorial form

→ helps in dismantling for repair.

#### d) Schematic Assembly Drawing

→ explaining working principle.

Note: Single stroke letter implies  $\Rightarrow$  thickness of letters

should be uniform. → Types → a) Type A

$\Rightarrow$  Capital letter divided in 14 equal parts.

#### b) Type B

$\Rightarrow$  preferred

$\Rightarrow$  10 equal parts capital letter

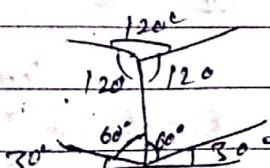
$\rightarrow$  for easy & fast execution.

The base angles used for monotone drawings

are

a)  $0^\circ$  &  $30^\circ$  b)  $30^\circ$  &  $45^\circ$  c)  $45^\circ$  &  $15^\circ$

d)  $30^\circ$  &  $60^\circ$



#. For common residential building permits from the municipalities, which is the most used scale for site plan preparation?

- a) 1:50 b) 1:100 c) 1:200 d) 1:500

# Circle in isometric projection is an ellipse

# A locus of points for which the sum of distances from each point to two fixed points is equal

- a) hyperbola b) ellipse c) cone d) parabola

# Recommended scales for floor plans are

- a) 1: 5000, 1: 500, 1: 250  
 b) 1: 300, 1: 1500, 1: 75  
 c) 1: 800, 1: 400, 1: 200  
 d) 1: 200, 1: 500, 1: 50

# Crayons are

- a) measuring instrument      b) drawing & writing instrument  
 c) drawing instrument      d) colored instrument.

# The most suitable to draw free hand is

- a) Rotating pen b) HB pencil c) Crayon d) Charcoal stick.

(#)

Building drawings are generally prepared in

- a). A<sub>1</sub> b). A<sub>2</sub> c). A<sub>3</sub> d). A<sub>4</sub>

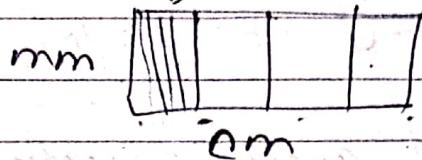
scales

# Vernier are used to read

- a) angle b) three arms c) two cent d) parallel  
 (scale of chord) (diagonal) (scale) (comparative)

vernier  
small distance

# Comparative scale: scales with same RF but graduate to read different units.  
Eg: using this inch. can be directly read on a metric scale or



# In an isometric projection square offaces are seen as:

- a) rectangles b) squares c) rhombus d) none.

Note: if isometric view of square  $\Rightarrow$  rhombus

# (A)  $\therefore$  length reduced is 0.815 of original aka equilateral quadrilateral or diamond.

# A drawing is a — representation of a real thing, an idea, or a proposed design for later manufacture or construction

- a) pictorial b) verbal c) graphic d) descriptive  
3D in 2D

# If  $s$  is one division on primary scale and  $n$  the total number of divisions in vernier, least count (LC) is,

a)  $\frac{s-1}{n}$  b)  $\frac{s}{n}$  c)  $\frac{st-1}{n}$  d)  $\frac{s}{n-1}$

# When primary information is in elevation, the interpretation is done by

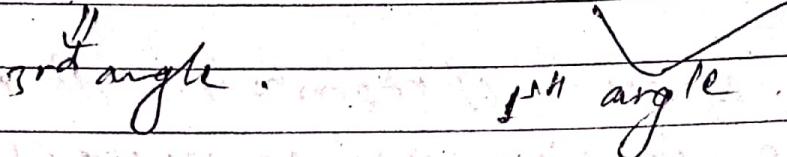
- a) oblique b) cavalier  $\rightarrow$  oblique  
c) isometric d) cabinet  $\rightarrow$  type.

#1.

Detailing of objects are done in

- 1:25
- 1:100
- 1:150
- 1:200

#. 3rd angle projection is the traditional system  
 a) American b) British c) Indian d) all

  
 3rd angle                          1st angle

#. The selection of suitable scale and allotment of proper space for margin, title block, revision, punch, folding marks on the drawing sheet is known as:

- Formatting
- Layout
- Folding
- Centring

Note: Formatting: