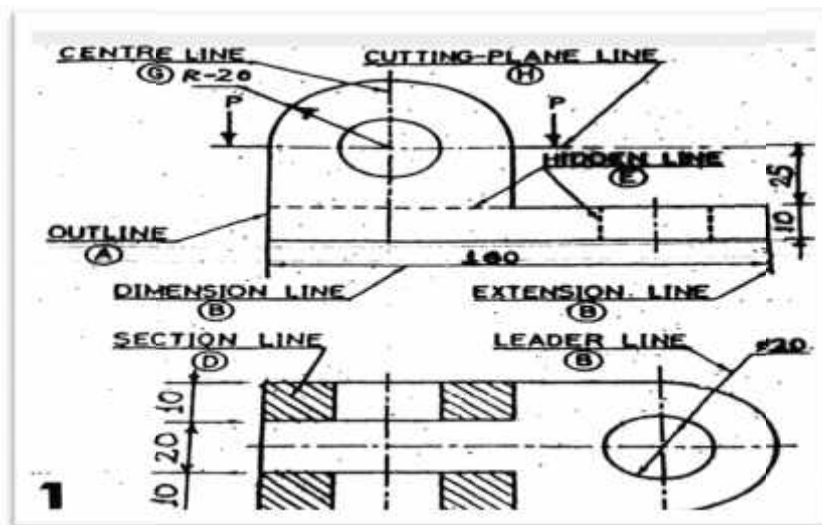


Topic3Lines , Lettering & Dimensioning

1. Write the application of various kinds of lines in Engineering Drawing. Or
 Draw different types of lines used in Engineering Drawing . Give its characteristics & applications.

Types of lines	Used for Drawing	Pencil Grade	Illustration
Continuous thick	Visible outline	HB	
Continuous thin	Dimension line, leader line, extension line, construction line and hatching lines.	2H	
Continuous thin (drawn free hand)	Irregular boundary line short break line	2H	
Continuous thin with zigzag	Long break line	2H	
Shorted dashes (Hidden line)	Invisible edges	H	
Long chain thin	Centre line, Locus lines, extreme position of moving parts, pitch circles	2H	
Long chain thick at ends and thin elsewhere	Cutting plane line	2H & H	

- (2)With the help of figure , show different type of lines such as outline ,dotted line, ladder line , section line ,dimension line , extension line, etc.




(3)With sketch state use of center line& dotted line drawing.

(a) Use of center line:

Show as center line for circle, cylindrical parts, hole (round) for symmetrical parts.

(b) Dotted line or dashed line or hidden line): -----

Used to show hidden lines & parts, hidden hole as dotted line.

(c) Cutting planeline : 

To show position of cutting plane if cutting the object.

(4)List types of lettering.

(a)Vertical lettering

(b) Inclined lettering (75°) are two main type of lettering.

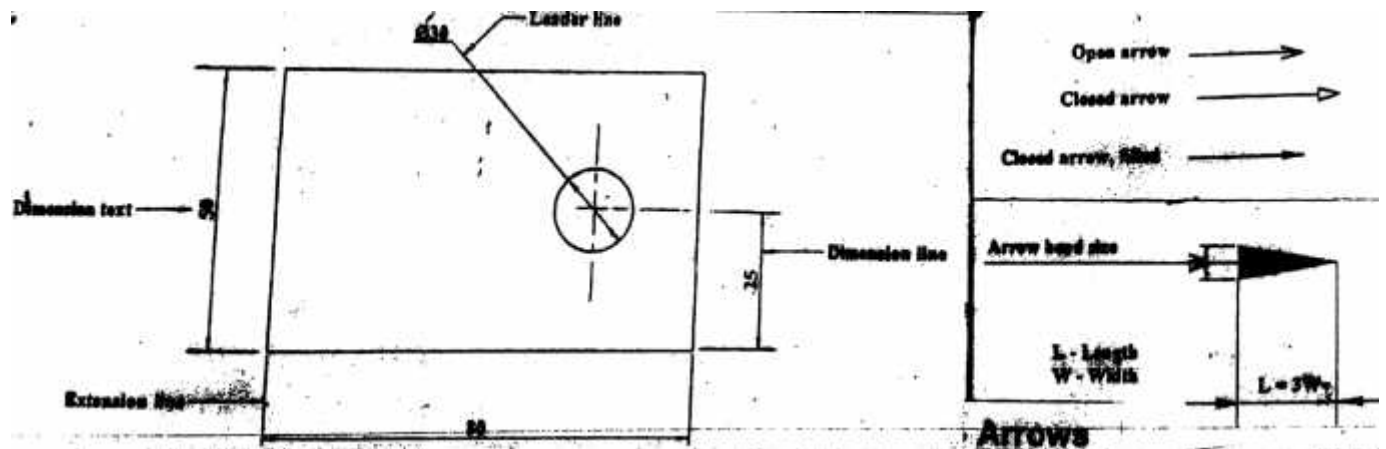
(c) single stroke vertical & inclined lettering

(d)Gothic vertical & inclined lettering.

(5) What is dimensioning? State the notations and terms used in dimensioning with sketches.

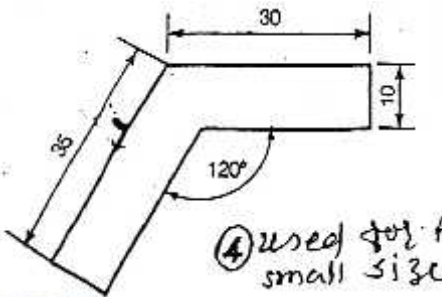
Dimensioning is used to describe a drawing in terms of detail such as size, shape and Specifications. Expressing these details in terms of numerical values and by using lines and symbols is known as “dimensioning”

Notation and terms: The following figure shows the notations and terms related to dimensioning. Dimensioning is carried out with the help of dimension lines, Arrowhead extension lines, leaders, figures (numerals) ,notes & surface roughness symbols etc.

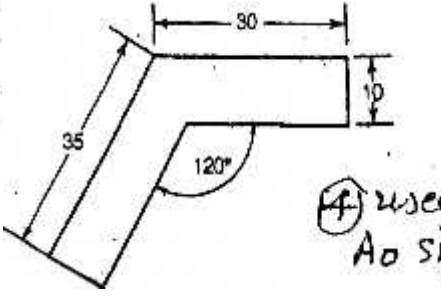


(6) Difference between Aligned system and Unidirectional method of dimensioning with the help of dimensioning with the help of sketches.

Aligned system	Unidirectional system
(1) dimension texts are always indicated Parallel to dimension line.	(1) dimension texts are indicated always horizontally irrespective of disposition of dimension line.
(2) Texts are placed just above the dimension line at the center.	(2) Dimension lines are broken in the middle to insert the dimension value or Texts.
(3) dimension could read either from bottom or from right side.	(3) Text are placed horizontally so could be read from bottom only.



④ used for A₁ & A₂ small size sheets



④ used for A₀ size sheet

(7) Enlist methods of dimensioning. Explain any one .

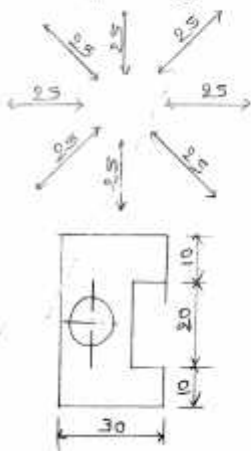
Two main methods are Aligned and Unidirectional.

- (a) Aligned system of dimensioning
- (b) Unidirectional system of dimensioning
- (c) Chain dimensioning
- (d) Parallel dimensioning
- (e) Combined dimensioning

A. Aligned system

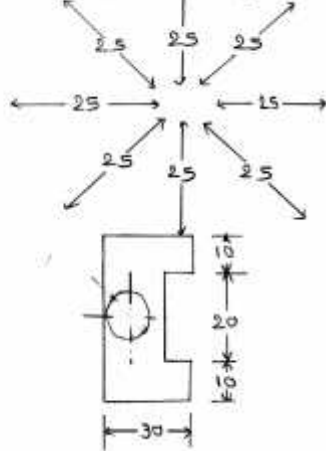
B. Unidirectional system

1. Aligned system

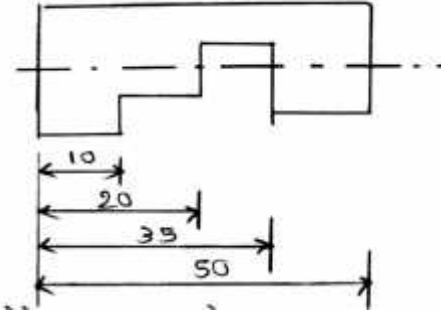
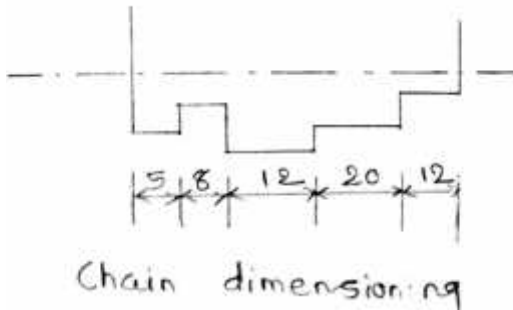


C. Chain Dimensioning

2. Unidirectional system



D. Parallel Dimensioning



Chain dimensioning	Parallel dimensioning
<ol style="list-style-type: none"> 1 successive dimensions are arranged in a straight line.(see fig) 2 Used where no trouble in functional requirement of machine parts. 3 Aligned or unidirectional method can be used. 	<ol style="list-style-type: none"> 1 Giving dimensions from one common datum feature in one direction. (see fig) 2 Cumulative error is avoided used for functional requirement. 3 Aligned or unidirectional method can be Used.

(8) General rules of dimensioning.

- (1) Dimensioning should be perfect so that there is no need of calculations, assumptions or measuring drawing.
- (2) Avoid indicating dimensions inside a drawing place it outside the view to show relevant feature.
- (3) Each dimension should be given once and not repeated in another view.
- (4) Dimensions should be taken from visible outlines and not from hidden lines.
- (5) Dimension line should not cross each other and if possible extension line also.
- (6) A center line an outline or extension line should not be used as a dimension line.
- (7) There should be gap of 5 to 6 mm between two dimension lines or between dimension line & outline of object.
- (8) Smaller dimensions should be placed near the view and larger ones away from the view.
- (9) For showing diameter ϕ , for radius-R, for square -SQ ,for hexagon-HEX, for sphere ϕ or sphere-R should be written before numerals say $\phi 50$, R15 ,SQ20.

(9) Explain with the help of sketches dimensioning methods of (1)angles (2)radius (3)different size of circles.

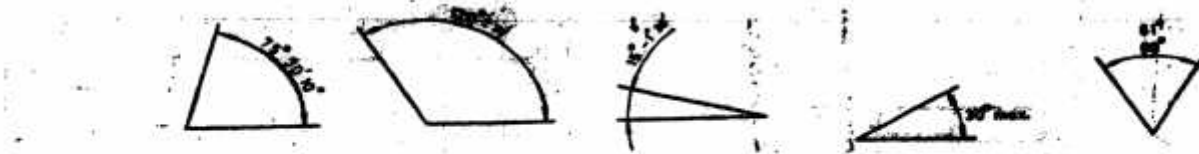


FIG. 3.16 : DIMENSIONING OF ANGLES.

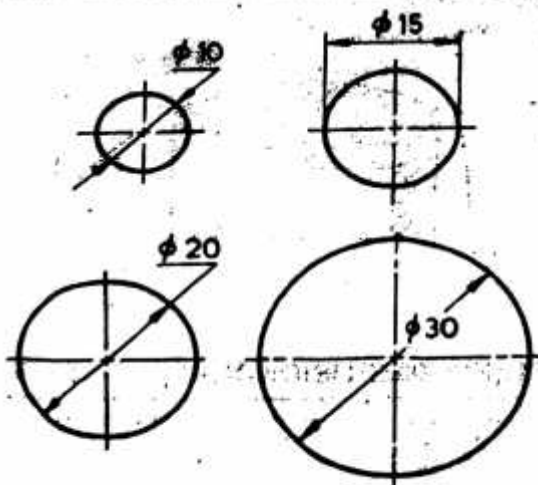


FIG. 3.14 : DIMENSIONING OF A CIRCLE

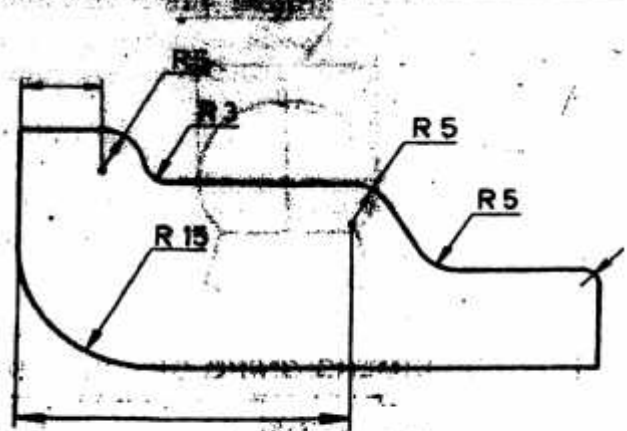


FIG. 3.15 : DIMENSIONING OF RADII