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Theory

1. A sectioned surface on an engineering drawing is represented by thin section lines(/) usually at an angle of 45 degrees.

2. List out the various principles to be followed while dimensioning a drawing.

- All dimension, extension, and leader lines should be thin, sharp, dark lines (.5mm/2H).
- Extension lines indicate the points between which the dimension figures apply. They are drawn perpendicular to the dimension lines, start with a visible gap (~1/32") between them and the object, and terminate 1/8" (3.2 mm) beyond the last arrowhead.
- Each dimension should be terminated by arrowheads touching the extension lines and pointing in opposite directions. Arrowheads are drawn freehand with .7mm/HB lead. The line should be broken only at the approximate center for the dimension figures.
- Dimensions shown with dimension lines and arrowheads should be placed to be read from the bottom of the drawing (unidirectional system).
- All dimensions should be given in decimal format. When dimensions are given in inches, leading zeros are omitted from dimension values less than 1.00
- When all dimensions on a drawing are given in inches, the inch marks (") are omitted, the same applies to millimeters. If metric units are used, the word METRIC will appear boxed in a spot toward the lower portion of the drawing sheet.
- A dimension line should never coincide with an object line or a center line, nor should it be an extension of these lines. Both, however, may be used as extension lines.
- Crossing of extension lines or dimension lines should be avoided if possible. Where such crossings are unavoidable, there should be no break in either of the lines. However, if extension lines cross dimension lines through the arrowheads, the extension line may be br
- Dimensions should be at least 3/8" (10 mm) from the object outline, then equally spaced at least 1oken. /4" (6 mm) apart. A continuous series of dimensions should be aligned rather than staggered. Standard practice is to place the shortest dimensions nearest to the object and space adjacent parallel dimension lines further away from the object in order of their length.
- Dimensions are preferably placed outside the outlines of the views.
- When placement outside the views will result in (a) dimensions too far from the distance they indicate, (b) long and confusing extension lines or leader lines that cross other lines of the drawing, or (c) any confusion in understanding where the dimension applies, they may be placed inside the view and close to the distance they indicate.
- As the distance dimensioned becomes less than about 1/2" (12.7 mm), the space between extension lines becomes too small for both arrowheads and figures. For these small dimensions the methods shown may be used. Each dimension should have two arrowheads associated with

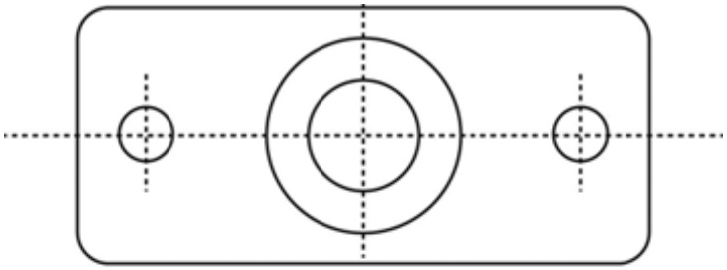
it, pointing in opposite directions. Dimensions can 'share' arrowheads. The following depicts appropriate forms for linear dimensions.

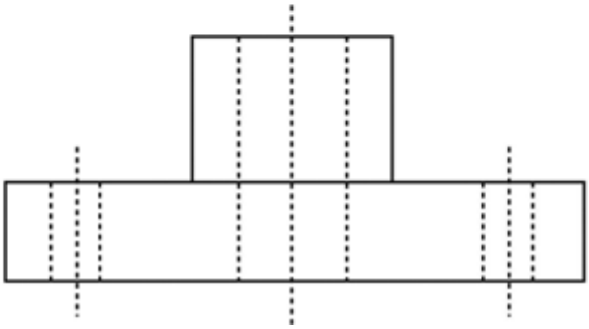
- Where there are several parallel dimension lines in a group, the dimension figures should be staggered so that they will not interfere with one another.
- Lettering (notes) should always be placed horizontal on the page, to be read from the bottom of the drawing (.7mm HB).

3. Explain the terms, (*a*) half section, (*b*) Full section

- Halfsection
  In this view, the section plane is used as one half to show the interior details when an object is symmetrical.

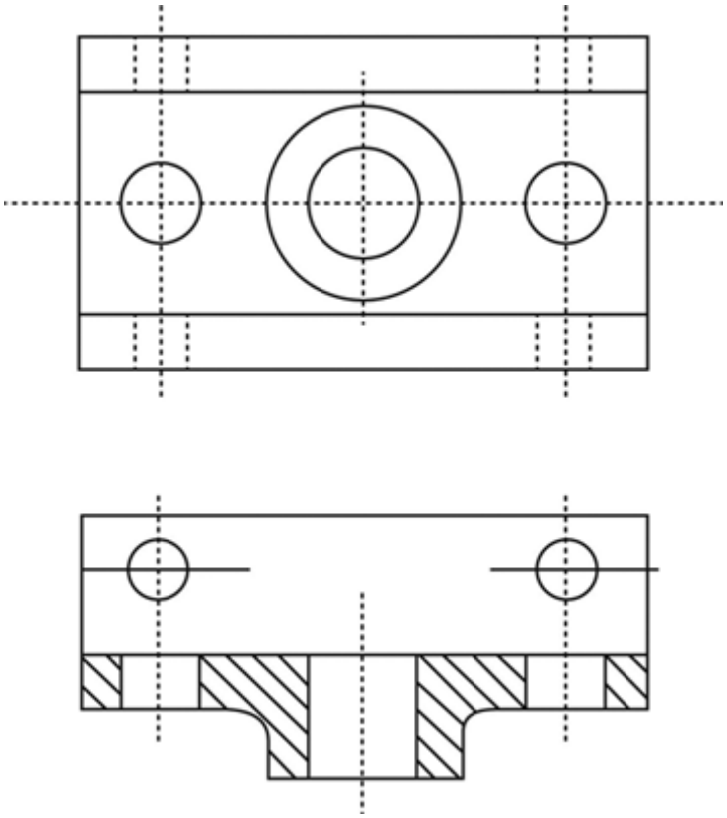
  The half-sectional view is shown below in Figure (2).





- Fullsection
  In this view, the section plane is across the object when the cutting plane is right. The full

sectional view is shown below in Figure (1).



4. How are leader lines terminated?

Leaders are used to connect numbers, References, or notes to the appropriate surfaces or lines on the drawing. From any suitable portion of the reference, note, or number, a short line is drawn parallel to the lettering. From this line the remainder of the leader is drawn at an angle (dog leg) to an arrowhead or dot. In this way, the leader will not be confused with other lines of the drawing. If the reference is to a line, the leader is always terminated at this line with an arrowhead, as shown in figure 3-33. However, a reference to a surface terminates with a dot within the outline of that surface.

5. What do you understand by, (a) scale = 5:1 and (b) scale = 1:10?

A 50mm line is to be drawn at a scale of **5:1** (ie 5 times more than its original size). The measurement **50mm** is **multiplied** by **5** to give **250mm**. A 250mm line is drawn.

A 50mm line is to be drawn at a scale of **1:10** (ie 10 times less than its original size). The measurement **50mm** is **divided** by **10** to give **5mm**. A 5mm line is drawn.

6. Give the shape identification symbols for the following: (*a*) diameter, (*b*) radius, (*c*) square and(*d*) spherical radius.

Centre line, (*b*) cutting plane line and (*c*) long break

7. What are the elements to be considered while obtaining a projection and what is an orthographic projection?

Orthographic projection, common method of representing three-dimensional objects, usually by three two-dimensional drawings in each of which the object is viewed along parallel lines that are perpendicular to the plane of the drawing. For example, an orthographic projection of a house typically consists of a top view, or plan, and a front view and one side view (front and side elevations)

8. When is a projection of an object called an orthographic projection?

For example, an orthographic projection of a house typically consists of a top view, or plan, and a front view and one side view (front and side elevations)

9. Explain the following, indicating the symbol to be used in each case:(*a*) First angle projection, (*b*) Third angle projection

First angle projection: In the first angle projection, the object is placed in the first quadrant meaning it's placed between the plane of projection and the observer.

Third angle projection: the third angle projection, the object is placed below and behind the viewing planes meaning the plane of projection is between the observer and the object.

Objective

1. A
2. B
3. C
4. B

5. A
6. B
7. C
8. B
9. B
10. A
11. C
12. A
13. D
14. C
15. D