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MECHATRONICS ENGINEERING

MATRIC NO: 18/ENG05/002

ENGINEERING DRAWING

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Engineering Drawing.
ENG 232 Questions

Solution

(1) Sections are used to show interior details clearly. A cutting-plane line ~~sho~~ shows where object was cut to obtain the section view. Cross-hatching is used in the section view and it shows the solid surface of the object which were cut through to produce the section.

(2) Principles of dimensioning.

(i) Dimension and projection lines are narrow continous lines 0.35mm thick, if possible, clearly placed outside the outline of the drawing.

(ii) Arrowheads should be approximately triangular, must be of uniform size and shape and in every case touch the dimension line to which they refer.

(iii) Centre lines must never be used as dimension lines but must be left clear and distinct. They can be extended, however, when used in the role of projection lines.

(iv) Dimensions are quoted in millimetres to the minimum number of significant figures.

(v) To enable dimensions to be read clearly figures are placed so that they can be read from the bottom of the drawing or by turning the drawing in a ~~clock~~ clockwise direction, so that they can be read from the right hand side.

(vi) Avoid dimensions over or through the object.

(vii) Holes should be located and sized in the view that shows that feature as a circle.

(3) (i) Half Section:

A half-section is a view of an object showing one-half of the view in section. The diagonal lines on the section are used to indicate the area that has been theoretically cut. These lines are called section lining or cross-hatching. A half section exposes the interior of one half of an object while retaining the exterior of the other half. Half sections are used mainly for symmetric objects or assembly drawings. A centerline is used to seperate the two halves. Hidden lines should not be shown on either half.

(ii) Full section

A full section is a complete, detailed cross sectional drawing of

an object. The cutting plane line passes fully through the part of the object. The Section-lined areas are those portions that have been in actual contact with the cutting-plane. It Splits the drawn object in two with the interior of the object revealed.

(4) leader lines are thin, solid lines that terminate in an arrow head or dot. Arrowheads are used when leader lines terminate at the outline of an object. Dots are used when leader lines terminate within the outline of the object or terminate on the surface of the object.

(5) (a) Scale = 5:1 : This means that the object is drawn 5 times bigger than its original size.

(b) Scale = 1:10 : This means that the object is drawn 10 times smaller than its original size.

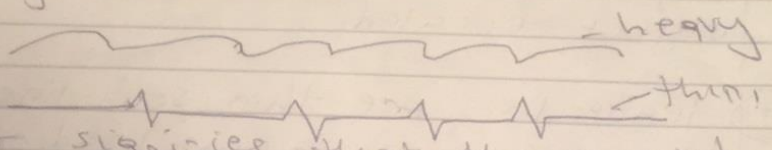
(6) Shape identification symbols for
(a) Diameter : Ø
(b) Radius : R
(c) Square : ⊠
(d) Spherical radius : SR

(7) centre line ——— - ——— - ——— for indication of symmetry for symmetrical objects.

(b) Cutting plane line.

It used to indicate a plane or planes in which a sectional view is taken.

(c) long break line



It signifies that the remainder of the part is simply a repetition of the portion shown.

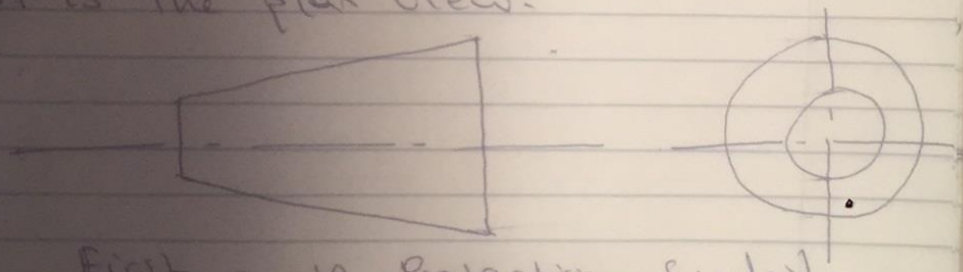
(7) As objects, have ~~three d~~ three dimensions like length, width and height/thickness. The shapes and sizes of three dimensional objects have to be represented on a sheet of drawing paper, which has only two-dimensional planes. For obtaining the image of an object, various points on the contour of an object, are thrown forward on to a plane by means of straight lines or visual rays. The image of the object is called projection.

Orthographic projections, sometimes referred to as orthogonal projection, used to be called analemma is a means of representing three dimensional objects in two dimensions. It is a form of parallel projection, in which all the projection lines are orthogonal to the projection plane, resulting in every plane of the scene appearing in affine

transformation on the viewing surface.

(8) A projection of an object, is called an orthographic projection usually when the front, side and plan view are drawn so that the person looking at the drawing can see all the important sides.

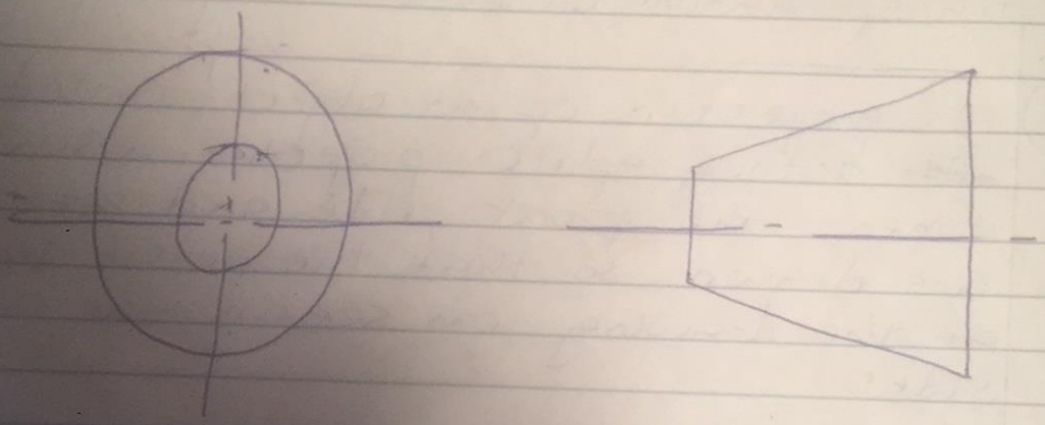
(9) (i) First angle projection: it is a type of orthographic projection which involves the placement of the object in the first quadrant and is positioned in front of the vertical plane and above the horizontal plane. The first drawing is the front view, the second is the side view and the last is the plan view.



First angle Projection Symbol.

(10) Third angle projection: This is another perspective projection method used to represent three-dimensional objects using a series of two dimensional views. In third angle projection, the 3D object to be projected is placed in the third quadrant and is positioned behind the vertical plane and below the horizontal

plane.



Third angle projection symbol.

Objectives Solution

~~Ans~~ Answers.

1. D - inclined plane
2. A - True
3. B - Equally
4. A - 60°
5. A - 60°
6. B - Rivet
7. C - Crowning
8. B - 45°
9. A - circle
10. A - an ellipse
11. C - cylinder
12. A - cone
13. B - thrust bearing
14. C - 55°
15. D - Horizontal Plane

ENG 232 QUESTIONS

1. How do you represent a sectioned surface on a drawing?
2. List out the various principles to be followed while dimensioning a drawing.
3. Explain the terms, (*a*) half section, (*b*) Full section
4. How are leader lines terminated?
5. What do you understand by, (a) scale = 5:1 and (b) scale = 1:10?
6. Give the shape identification symbols for the following: (*a*) diameter, (*b*) radius, (*c*) square and (*d*) spherical radius.

(a) 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?
8. When is a projection of an object called an orthographic projection?
9. Explain the following, indicating the symbol to be used in each case: (*a*) First angle projection, (*b*) Third angle projection

Objectives

1. To project the auxiliary view, an imaginary plane known as …….
    a) Reference Plane
    b) Principle plane
    c) Normal plane
    d) Inclined plane
2. Reference plane is parallel to the direction of view
    a) True
    b) False