**NWANKWO CHUKWUERIKE**

**17/MHS01/205**

**BIOMEDICAL ENGINEERING**

**THEORY**

1. Section lines are very light. When sketching an object or part that requires a sectional view, they are drawn by eye at an angle of approximately 45 degrees, and are spaced about 1/8” apart. Since they are used to set off a section, they must be drawn with care.
* 1. All dimension, extension, and leader lines should be thin, sharp, dark lines (.5mm/2H).
* 2. 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.

* 3. 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.

* 4. Dimensions shown with dimension lines and arrowheads should be placed to be read

from the bottom of the drawing (unidirectional system).

* 5. 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

* 6. 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.

* 7. 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.

* 8. 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 broken.

* 9. Dimensions should be at least 3/8" (10 mm) from the object outline, then equally

spaced at least 1/4" (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.

* 10. Dimensions are preferably placed outside the outlines of the views. (See rule #11)
* 11. 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.

* 12. 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.

* 13. 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.

* 14. Lettering (notes) should always be placed horizontal on the page, to be read from the

bottom of the drawing (.7mm HB).

* Half Section is used to the exterior and interior of the part in the same view. ν The cutting-plane line cuts halfway through the part and removes one quarter of the material. ν The line that separates the different types (interior and exterior) may be a centreline or a visible line.
* In a full section, the cutting plane line passes fully through the part. ν Normally a view is replaced with the full section view. ν The section-lined areas are those portions that have been in actual contact with the cutting-plane.
1. With the use of arrow heads
2. when the scale is 5:1 it means that everything is in reality 5 times as small. in other words, 1cm in drawing is 0.2 cm in reality. When a scale is 1:10 it means that the object is 10 times smaller than the real-life scale 1:1. you could also say 1 unit in the drawing is equal to 10 units in real life.
3. φ : Diameter, Sφ : Spherical diameter, R : Radius, SR : Spherical radius, : Square
4. I) Front and end elevation

ii) Orthographic projection 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. The obverse of an orthographic projection is an oblique projection, which is a parallel projection in which the projection lines are not orthogonal to the projection plane.

1. a projection of an object is known as orthographic when it is drawn in a 2D format and the plan front elevation and end view are drawn separately with parallel lines connecting the three together
2. **i) First angle** projection is a method of creating a 2D drawing of a 3D object



ii) 3rd **Angle** project is where the 3D object is seen to be in the 3rd quadrant. It is positioned below and behind the viewing planes, the planes are transparent, and each view is pulled onto the plane closest to it. The front plane of **projection** is seen to be between the observer and the object.



**OBJECTIVES**

1. a
2. b
3. c
4. a
5. a
6. b
7. c
8. b
9. b
10. a
11. c
12. a
13. c
14. c
15. d