**GURU TEGH BAHADUR INSTITUTE OF TECHNOLOGY**

**G-8 AREA, RAJOURI GARDEN, NEW DELHI**

**Unit 1**

**(CO1: To understand the basics of letter writing, dimensioning and projection)**

**Assignment No 1**

1. Write the sentence given below in vertical single stroke letters usingheight 14 mm and ratio 7:4.

I LIKE TO PLAY ……………OUTDOOR GAME.(UPPER CASE)

I like to play ……………indoor game.(lower case)

1. Draw the projection and dimensioning notation as shown in the figure 1 and identify the different types of line ( for reference use figure 2).

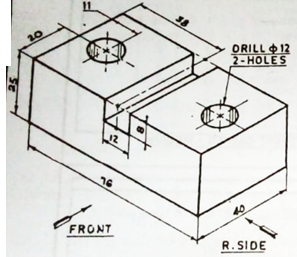
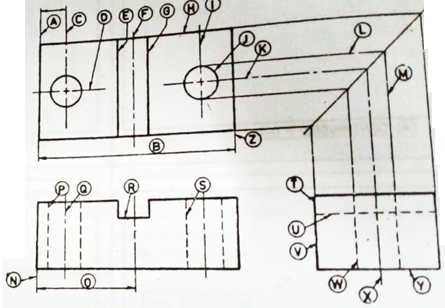
 

Figure 1 Three-D object Figure 2 Projection of object (front view,top view,side view)

1. Draw the projections of following points on a single line.
   1. A point ‘P’ 25 mm above HP and 20 mm behind VP
   2. A point ‘Q’ 20 mm below HP and 25 mm behind VP
   3. A point ‘R’ 25 mm below HP and 20 mm in front of VP
   4. A point ‘S’  20 mm above HP and 25 mm in front of VP
   5. A point ‘T’ on HP and 25 mm in front of VP
   6. A point ‘U’ on HP and 25 mm behind VP
   7. A point ‘V’ on VP and 20 mm above HP
   8. A point ‘W’ on VP and 20 mm below HP
   9. A point ‘X’ on HP as well as VP both
2. A point is 25 mm away from HP and its shortest distance from XY line is 50mm. Draw its plan and elevation in 1stquadrant.
3. A point Q is 40 mm above HP and 20 mm in front of VP. Draw the projection of point Q on an auxiliary vertical plane(AVP) if inclined at an angle of 45º to VP also auxiliary horizontal plane(AHP) if inclined at an angle of 30º to HP.

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**Unit 1**

**(CO1: Ability to understand importance of scale)**

**Assignment No 2**

1. Construct a plane scale of 1:4, to show centimeters and long enough to measure up to 5 decimeters. Show 35cms on the scale.

2. Construct a diagonal scale of RF = 3:200 showing meters, decimeters, and centimeters. The scale should measure up to 6 meters. Show 4.56 meters on the scale.

3.An area of 144 sqcm on a map represents an area of 9 sqkm on the field. Find the R.F.of the scale for this map and draw a diagonal scale to show kilometers, hectometers, and decameters and to measure upto 5 kilometers. Indicate on the scale 3.56km.

4. Draw a backward vernier scale of R.F. = 1/25 to read up to 4 meters and show the length of 2.39 meter.

5.Draw a forward vernier scale of RF 1/2500 and long enough to measure 300 meters. Show on it 157 meters.

6. Construct an isometric scale for isometric drawing to measure a maximum length of 200 cm. Let 1cm represents 20 cm.

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**Unit II**

**(CO2: Ability to do projection of lines)**

**Assignment No 3**

1. Draw the projections of line AB and locate its traces with the following conditions.  
   (a) A line ‘AB’ having true length equals to 65 mmis parallel to both the planes. The point A of line AB is 30 mm above HP and 20 mm in front of VP.

(b)A line AB with truelength 60 mmis perpendicular to HP and parallel to VP. The point A of line AB is on HP and 20 mm in front of VP ,

(c) A line AB with true length 60 mmis perpendicular to VP and parallel to HP. The point A of line AB is in VP and 10 mm above HP.

(d) A Line AB with true length 60mm is parallel to VP andinclined at 35º to HP. The point A of line AB is 10 mm above HP and 20 mm in front of VP

(e)A line AB with true length 60 mm is parallel to HP andinclined at 35º to VP. The point A of line AB is 10 mm above HP and 20 mm in front of VP.

1. A line AB has its end A 15 mm away from HP and 55 mm away from the VP, end B 45 mm from the HP and 10 mm from VP. The line lies in a profile plane. Draw the projection of the line, assuming it to be in First quadrant.
2. A line CD measuring 80 mm is inclined at an angle of 30º to HP and 45º to VP. The point C is 20 mm above HP and 30 mm in front of VP. Draw the projections of the straight line by rotational method.
3. The top view and the front view of the line EF, measures 60 mm and 50 mm respectively. The line is inclined to HP and VP by 30º and 45º, respectively. The end E is on the HP and 10 mm in front of VP and the end F is in the 1st quadrant. Draw the true length of the line EF by rotational method.
4. A line AB, 80 mm long has its end A, 10 mm above the HP and 15 mm in front of the VP.The end B is 60 mm above the HP and 50 mm in front of the VP. Draw the projections of the line and find its true inclinations with the HP and VP.
5. A line YZ, 65 mm long, has its end Y 20 mm below HP and 25 mm behind VP. The end Z is 50 mm below HP and 65 mm behind VP. Draw the projections by trapezoidal method and finds its inclinations with HP and VP.

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**Unit III**

**(CO3: Ability to do projection of planes)**

**Assignment No 4**

1. A rectangular lamina ABCD, 60 mm \* 40 mm is perpendicular to HP and inclined at 30º to VP.The side of length 40 mmis 15mm in front of VP. Draw its projection.
2. An isosceles triangle lamina ABC having its base 50 mm and altitude 90 mm resting on HP on its base. The lamina of triangle is inclined at an angle 40° to the HP and the altitude in the top view is inclined at the angle 60° to the VP. Draw the projections.
3. A pentagonal plane of side 30 mm is held on VP on one of its corner. The pentagonal plane is inclined at 40° to the V.P and plane is perpendicular to HP. The edge opposite to that corner is perpendicular to H.P. Draw the projections.
4. A regular hexagonal lamina, of side 30 mm, rests on one of its side on HP such that lamina is inclined to the HP at 45º. Its corner nearest to VP is 15 mm away from the VP. Draw its projection in first angle.
5. A regular pentagon of 30 mm sides is resting on one of its sides with its surface 45˚ inclined to HP .Draw its projections when the side in HP males 30˚ angle with VP.
6. A hexagonal lamina has its one side in HP and its opposite parallel side is 25mm above HP and in VP. Draw its projection.
7. A circle of 50 mm diameter is resting on HP on end A of its diameter AC which is 30˚ inclined to HP and 45˚ inclined to VP. Draw its projection.

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**Unit IV**

**(CO3: Ability to do projection of solids)**

**Assignment No 5**

1. A hexagonal prism of 30 mm side and axis height 70 mm, resting on the HP on one of its edges. such that the axis is inclined at 60º to the V.P. Draw its projections.
2. A pentagonal prism of side 40 mm and axis height 90 mm rests on one of its corner of its base on HP such that the axis is inclined at an angle of 40° with HP. Draw its projection.
3. A hexagonal pyramid of base 30 mm side and axis length 90 mm rests on one of its slant edge on the H.P. such that the plane containing slant edge on which it rests on H.P. is inclined at 45° to V.P. and the apex is near to the V.P. Draw its projection.
4. A square pyramid,30 mm base sides and axis 60 mm long, has a triangular face on the ground and vertical plane containing the axis makes an angle of 45° with the VP. Draw its projections. Take apex nearer to VP.
5. A cylinder 40 mm diameter and 50 mm axis is resting on one point of a base circle on VP while its axis makes 45º with VP and 35º to the HP. Draw the projections.
6. A cone of 40 mm diameter and 50 mm axis is resting on one generator on HP which makes 30° inclination with VP.Draw the projections.

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**Unit IV**

**(CO3: Ability to do development of surfaces)**

**Assignment No 6**

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Description automatically generated

1. A square prism of base side 40mm and axis length 50 mm is resting on HP on one of its base with a side of base with a side of base inclined at 350 to VP. It is cut by a plane inclined at 300 to HP and perpendicular to VP and is bisecting the axis. Draw the development of the remaining portion of the prism.
2. Draw the development of the lower portion of a cylinder of diameter 45 mm and height 60 mm when sectioned by a plane inclined at 400 to HP and perpendicular to VP and bisecting the axis.
3. A pentagonal pyramid of base 25 mm side and height 65 mm stands with its base on the HP such that one of its base edges is parallel to the VP. It is cut by a section plane perpendicular to the VP and inclined at 300 to the HP, bisecting the axis. Draw the development of the lateral surfaces of solid.
4. A pentagonal pyramid of base 30 mm side and the height 60 mm stands with its base on the HP on its base edges is perpendicular to the VP. It is cut by a section plane perpendicular to the VP and parallel to the HP and meets the axis at a distance of 25 mm from the vertex. Draw the development of the lateral surfaces of solid.
5. A cylinder of diameter 40 mm and axis height 75 mm is cut by a plane perpendicular to VP inclined at 550 to HP meeting the axis at the top face. Draw the development of the lateral surface of solid.