PROJECTIONS OF STRAIGHT LINES

Q1) A line AB measuring 70mm as its end A 15mm infront of VP and 20mm above HP & other end B is 60mm infront of VP and 50mm above HP. Draw projections of line PQ finding true inclination with HP & VP.

Q2) A line AB 80mm long has its end A 20mm above the HP and 30mm infront of VP. It is inclined at 30 degree to HP and 45 degree to VP. Draw projections of line and find apparent length and inclinations.

Q3) A line AB has its end A 20mm above HP & 30mm infront of VP. The other end B is 50mm above HP & 45mm infront of VP. The distance between end projectors is 70mm. Draw projections and finds true length, apparent
inclination.

Q4) A line PQ 85mm long has its end 'P' 10mm above HP and 15mm infront of VP. The top view and front view of line are 75mm & 80mm respectively. Draw projections and find true length, apparent inclination.

Q5) The top view of a line 75mm long measures 50mm. The end P is 30mm infront of VP & 15mm above HP. The end Q is 15mm infront of VP & above HP. Find true inclination with HP & VP.

Q6) The front view of a line PQ 80mm long measures 50mm and is inclined to XY at 50 degree. One end of the line is 20mm above HP and 25mm infront of VP. Draw the front and top view of line and find the inclination of line with HP and VP.

Q7) A line AB 100mm long measures 80mm infront view & 70mm in top view .The midpoint 'M' of the line is 40mm from both HP & VP. Find its inclinations.

Q8) Draw projection of line AB 100mm long inclined 45 degree to VP AND 30 degree to HP. One end of the line is 20mm above the HP & in VP. Find apparent length and inclinations.

Q9) The topview of a 75mm long line AB measures 65mm, while the front view is 50mm. Its one end A is in the HP and 12mm infront of VP. Draw projections of AB and find its inclinations wit HP and VP.

Q10) The end A of a line AB is 20mm above HP and 15mm infront of VP. The distance between the ends measured parallel to the reference line is 70mm and distance measured perpendicular to reference line , between the ends A and B, in the front view and in the top view are 40mm and 30mm respectively. Draw the projection of AB and find the true length and inclination with HP and VP.

Application Problems:

Q1).An Electric switch (A) and the blub (B) fixed on a wall are 5m apart. The distance between them, measured parallel to the floor is 4m, if the switch is 1.5m above the floor, find the height of the bulb and the inclination of the line joining the switch and bulb with floor.

Q2).A room of 5mtx3mtx4mt high. An electric lamp suspended vertically from the centre of the ceiling at a distance of 0.8mt from it. Find the distance of the lamp from any one of the ground corners and the slope angle of the connecting line with ground.

Q3).A room 5mtx4mtx3mt high. Determine graphically the length of the diagonal of the room / space choosing a suitable scale.

Q4).A chimney of a boiler is 25mt high and 1.5mt in diameter. This chimney is supported by three guy wires which appears in the TV at 120o to each other. The ends of the wires are pegged to the top of the chimney. Find the length of three guy wires.

Q5).A chimney of a boiler is 10 m high and 2 m in diameter. This chimney is supported by guy wires which appear in top view at 120° to each other. The ends of the wires are pegged to the ground at distances of 3 m, 4 m and 5 m from the centre of the chimney. The other ends the wire are connected to the top of the chimney. Find the length of the three guy wires.

Q6).Two oranges on a tree are respectively 1.8 and 3mt above the ground and 1.2mt and 2.1mt from 0.3mt thick wall but on the opposite sides of it. The distance between the oranges measured along the ground and parallel to the wall is 2.7m. Determine the real distance between the oranges.

Q7).An electric lamp is hung vertically from the center of flat roof of a room 4mtx5mt and height of 4mt at a height 3mt above the floor. Find graphically the distance between the lamp and anyone of the corner below select suitable scale.

Q8).An auditorium of a college is having 100m length, 50m width and 20m maximum height. A light point is fitted at the center of the roof and its switch is kept on one of the side walls of the auditorium. 1.5m above the floor and 10m from one of the adjacent wall. Find the distance between the light points and its switch. Adopt a scale 1:500.

Q9).Three wires AB, CD and EF are tied at points A, C, E on a vertical pole 14 m long at height 12 m, 10 m and 8 m respectively from the ground. The lower ends of the wires are tied to hooks at point B, D and F on the ground level all of which lie at the corners of an equilateral triangle of 7.5 m side. If the pole is situated at the centre of the triangle, determine the length of each rope and their inclination with the ground. (Use scale 1:100)

Q 10). A room is 6 m X 5 m X 4 m high. An electric bulb B is above the centre of the longer wall and 1 m below the ceiling. The bulb B is 50 cm away from the longer wall. The switch S for the light is 1.25 m above the floor on the centre of the adjacent wall. Determine graphically, the shortest distance between the bulb B and the switch S.

Q 11).A room having a length of 5m, breadth of 3.5 m and Height of 4m has a electric lamp hung from the center of the ceiling of height of 2.5 m above the floor. Determine the graphically the distance from the lamp from the bottom corner of the room scale 1cm = 1m

Q 12). Find graphically the length of the body diagonal and its inclination with HP and VP of a room measuring 6m X5mX 4m (scale 1cm = 1m)

Q 13). A chimney of boiler is 25 m high and 2m dia. The chimney is supported by three guy wires which are pegged to the ground at a distance of 4m, 5m, 6m from the centre of the chimney. The other ends of the wires are connected to the top of the chimney at its periphery. Find the length of the guy wire and their slope angle with ground (scale 1cm = 2m)

Q 14).Three vertical poles AB, CD and EF are respectively 2m, 4mand 8m long. Their ends B,D and F are on the ground and form the corner of an equilateral

triangle of 5m long sides. Determine graphically the distance between the top ends of the poles namely AC, CE and AE and also inclination of these with the ground (scale 1:20)

Q 16). A room is 6 m X 5 m X 3.5 m high. An object is placed 1.2m above the centre of the room. Determine graphically its distance from one of the corners between the roof and adjacent walls, select a scale of 1:50.

Q 17). A divider opened at 45deg is so placed on the ground (HP) such that both ends are equidistance in front of VP and hinged end is 50mm above the ground. If the distance between the ends is 80mm, draw the projections of the divider in the given position and determine the true length of the kegs of the divider. Also determine the inclination of each leg with the reference plane of projection (HP &VP).

PROJECTION OF PLANES

1. A triangular plane lamina of sides 40 mm is resting on HP with one of its corners touching it such that the plane surface makes an angle of 60^{o} with HP. If the side opposite the corner on which the plane lamina rests makes an angle of 30^{o} with the VP. Draw its projections

2. A 30^{o}-60^{o} set square of 90 mm long is so kept that the longest side is in HP making an angle of 30^{o} to VP. The set square itself is inclined at 45^{o} to HP draw the projections of the set square

3. Triangular lamina of 40 mm sides rests on one of its corners on HP such that the median passing through the corner on which it rests is inclined at 30^{o} to HP and 45^{o} to VP

4. A square lamina of 30 mm side rests on one of its sides on HP. The lamina makes 60° to HP and the side on which it rests makes 30 to the VP. Draw its projections

5. Draw the top and front views of a square lamina of 40 mm side placed on HP with one edge making 45° with VP and the surface of the square is inclined at 30° to HP.

6. A square plate of 40 mm sides rests on HP such that one of the diagonals is inclined at 30° to HP and 45° to VP. Draw its projections.

7. A Rectangular lamina 40 mm and 90 mm sides is resting on one of its smaller sides making 30^{o} inclination to VP, while surface of the plane makes 45^{o} with HP draw its projections

8. A rectangular plate of 40 mm x 60 mm rests on HP on one of its edges. This edge is inclined to VP at 45° and the plate surface makes 30° angle with HP. Draw its projections.

9. A regular pentagonal lamina of 40 mm sides is resting on HP on one of its sides with its surface 45^{o} inclined to HP. Draw its projections when the side in HP makes 30^{o} angle with VP

10. A regular pentagonal lamina of 40 mm sides is resting on HP on one of its sides while its opposite corner is 40 mm above HP. Draw projections when side in HP is 40^{o} inclined to VP

11. A pentagonal lamina having edge 40 mm is placed such that the perpendicular bisector of one of the edges is inclined at 30° to HP and 45° VP. Draw the top and front views of the lamina.

12. A pentagonal lamina of sides 30 mm is having a side on both HP and VP the surface of the lamina is inclined at an angle of 60° HP. Draw top view and front view of the lamina.

13. A regular pentagonal lamina of 30 mm sides is resting on one of its side on HP while the opposite corner to this side of the lamina touches VP. If the lamina makes an angle of 60° with HP and 30° with VP, draw the projections of the lamina.

14. Draw the projections of a regular hexagon lamina of 30mm sides, having one of its sides in the HP inclined at 60^{o} to the VP and its surface making an angle of 45^{o} with the HP

15. A regular hexagonal lamina of 30 mm sides rests on one of its edges. The lamina makes 60° to HP and the edge on which it rests makes 60° to VP. Draw the projections.

16. Draw the top and front views of a hexagonal lamina of 50 sides having two of its edges parallel to both planes and its nearest edge is 20 mm from each plane. The surface of the lamina is inclined at an angle of 60° to the horizontal plane.

17. A hexagonal plane figure of side 30 mm, is resting on a corner in HP with its surface making an angle of 30° with the HP. The top view of the diagonal passing through that corner is inclined at 40° to the reference line XY. Draw the projections of the plane figure.

18. A regular hexagonal lamina ABCDEF of sides 30 mm is lying in such a way that one of its sides touches both the reference planes. If the lamina makes 60° with the VP. Draw the projections of the lamina.

19. Draw the projections of a circular plate of 50 mm diameter resting on HP on a point A on the circumference with its plane inclined at 45° to HP and the top view of the diameter AB making 30° with VP.

20. A circular lamina of 60 mm diameter is standing with one of its points on the rim on HP and the lamina inclined at 45^{o}to HP. The diameter at right angles to the diameter passing through the point on which the lamina rests is parallel to VP Draw its projections.

21. A thin plate having shape of an isosceles triangle has base 50 mm long and altitude 70 mm. It is so placed that in the front view it is seen as an equilateral triangle of 50mm sides and the edge on which its rest is inclined at 45^{o} to XY. Draw projections

22. A rectangular lamina of 60 mm x 90 mm rests on HP on one of its shorter edges. The lamina is rotated about the edge on which it rests till it appears as a square in the top view. The edge on which the lamina rests being parallel to both HP and VP. Draw its projections in this position and find its inclinations with HP and VP

23. A mirror 60 mm x 80 mm is inclined to the wail at such an angle that its front view is a square of 60 mm side. Find the inclination of the mirror with the wall.

24. The top view of a square lamina of side 60 mm is a rectangle of sides 60 mm x 20 mm with the longer side of the rectangle being parallel to both HP and VP. Draw the top and front views of the square lamina. What is the inclination of the surface of the lamina with HP and VP