DEPARTMENT OF MECHANICAL ENGINEERING

ENGINEERING GRAPHICS(21ME14/24)

QUESTION BANK

MODULE -2. PROJECTION OF STRAIGHT LINES

1. A line AB 80mm long has its end A 20mm above the HP and 30mm infront of VP. It is inclined at 30^0 to HP and 45^0 to VP. Draw the projections of the line and find apparent lengths and apparent inclinations.

2. A line AB 80 mm long is inclined to HP at 30^0 and inclined to VP at 45^0• The end A lies in both HP and VP. Draw front and top views of line and determine their lengths. Also measure the perpendicular distance of end B from both HP and VP.

3. A line AB has its end A 20 mm above the HP and 30 mm infront of the VP The other end B 60 mm above the HP and 45 mm infront of VP. The distance between end projectors is 70 mm. draw its projections. Determine the true length and apparent inclinations.

4. A line PQ 85 mm long has its end P 10 mm above the HP and 15 mm in front of the VP. The top view and front view of line PQ are 75 mm and 80 mm respectively. Draw its projections. Also determine the true and apparent inclinations of the line.

5. The top view PQ of a straight line is 70 mm and makes an angle of 600 with XY line. The end Q is 10 mm infront of VP and 30 mm above the HR The difference between the distances of P and Q above the HP is 45 mm draw the projections. Determine its true length and true inclinations with HP and VP.

6. The front view of a 90 mm long line which is inclined at 45° to the XV line, measures 65 mm. End A is 15 mm above the XY line and is in VP. Draw the projections of the line and find the inclinations with HP and VP.

7. The distance between the end projectors through the end points of a line AB ¡s 60 mm. The end A is 10 mm above HP and 15 mm infront of VP. The end B is 35 mm infront of VP The line AB appears 70 mm long ¡n the front view. Complete the projections. Find the true length of the line and its inclinations with HP and VP

8. Draw the projections of a straight-line AB, 100 mm long, inclined at 45° to HP and 30° to VP. The end A is in HP and the end B is in VP. Find the shortest distance between the straight line AB and the line of intersection of planes of projections.

9. A straight line PQ, 65 mm long, is inclined at 45° to HP and 30^0 VP The point P is 70 mm from both the reference planes and the point Q is towards the reference planes. Draw the projections.

10. The top view of line PQ 75 mm long measures 50 mm. The end P is 30 mm in front of VP and 15 mm above HP The end Q is 15 mm in front of VP and above HP. Draw the Projections of the line and find its true inclinations with HP and VR Find the length of front view and distance between the end Projectors.

11. One end of a line is 30 mm in front of VP and 30 mm above HR The line is inclined at 40^0 to HP and its top view measuring 60 mm, is inclined at 50^0 to XY. Draw the projections of the line and determine true length and inclination with VP.

12. The top view of a line 75 mm long measures 50 mm. The end P is 30 mm infront of VP and 15 mm above HP. The end Q is 15 mm infront of VP and above HP. Draw the projections of the line and find its true inclinations with HP and VP.

13. A line AB has its end A 20 mm above the HP and 15 mm infront of the VP. The other end B is 60 mm above the HP. The distance between end projectors is 70 mm. Draw its projections. Determine the apparent lengths and true inclinations.

14. A line has its end A 10 mm above HP and 15 mm infront of VP. The end B is 55 mm above HP and line is inclined at 30° to HP and 35° to VP. The distance between the end projectors is 50 mm. Draw the projections of the line. Determine the true length of the line and its inclination with VP.

15. A line AB 60 mm long has one of its extremities 20 mm in front of VP and 15 mm above HP. The line is inclined at 25° to HP and 40° to VP. Draw its top and front views.

16. A line AB measuring 70 mm has its end A 15 in front of VP and 20 mm above HP and the other end B is 60 infront of VP and 50 mm above HP. Draw the projections of the line and find the inclinations of the line with both the reference planes of projection.

17. The distance between the end projectors through the end points of a line AB is 40 mm. The end A is 20 mm above HP and 15 mm in front VP. The end B is 45 mm infront of VP. The line AB appears 50 mm long in the front view. Complete the projections. Find the true length of the line and its inclinations with HP and VP

18. A line AB 100 mm long is inclined to HP at 45^0 and inclined to VP at 30^0. Draw front and top views of line and determine their lengths. Also determine the perpendicular distance of end Q from both HP and VP.

19. The top view of a 75 mm long line AB measures 65 mm, while the front view is 50 mm. Its one end A is in the H.P and 12 mm in front of the VP. Draw the projections of AB and determine its inclinations with the HP and the VP.

20. A line AB, 65 mm long, has its end A 20 mm above the HP and 25 mm in front of the VP. The end B is 40 mm above the HP and 65 mm in front of the VP. Draw the projections of AB and show its inclinations with the HP and VP.

21. The top view of a line PQ is 70 mm and front view is 60 mm long. The end Q is nearer to both HP and VP than the end P and is 15 above HP and 20 mm in front of VP. Draw the projections of the line if the distance between projectors is 50 mm.

22. A line has its end A 15 mm above HP and 10 mm in front of VP. The end B is 55mm above HP and the line is inclined at 30^0 to HP. The distance between the end projectors is 50 mm. Draw the projections of the line and determine the true length of the line and its inclinations with VP.

23. A line has one end 30 mm infront of VP and 15 mm above HP and the other end is 15 mm in front of VP and is above HP. Length of the line is 60 mm. Top view of the line is 40 mm long. Draw the two views of the line and obtain the inclination of the line with HP and VP.

24. The front view of the line PQ 80 mm long measures 50 mm and it is inclined to XY (reference line) at 50. One end of the line P is 20 mm above the HP and 25 mm in front of the VR Draw the front view and top view of the line and find the inclinations of the line with HP and VP.

25. Draw the projections of a line AB 100 mm long inclined at 45^0 to VP and 30^0 to HP. One end of the line is 20 mm above the HP and in the VP. Also determine the apparent length and inclinations.

26. Draw the projections of a line PQ and find its true length and inclinations when the line is inclined at 30^0 to the HP and 45^0 to the VP. The line is having one of its ends 15 mm above HP and 20 mm in front of VP. The distance between the end projectors on the XY line is 60 mm.

27. The top view AB of a straight line AB is 60 mm long and makes an angle of 30^0 with the XY line. The end A is in VP and 30 mm above HP. The end B is 65 mm above HP. Draw the projections of the line AB and determine

28. i) length of the front view ii) its true length and true inclinations with the reference planes.

29. A line AB 65 mm long, has its end A 25 mm above HP and 30 mm in front of VR The other end is 45mm above HP and 50 mm in front of VR Draw the projections and determine its inclinations.

30. One end of a line is 30 mm in front of VP and 30 mm above HP. The line is inclined at 40^0 to HP and its top view measuring 60 mm, is inclined at 50^0 to XY. Draw the projections of the line and determine true length and inclination with VP. .

31. A line PQ is inclined to both HP and VP by 30^0 and 45^0 respectively, one of its ends P is at a distance of 10 mm from HP and 15 mm from VP. The distance between the end projectors is 45 mm. Draw the top, front and side views of the line. Determine the true length of the line and the distances of the end Q from VP and HP.

32. The elevation of a line AB 90 mm long, is inclined at 30^0 to HP and measures 70 mm. The end A is 20 mm above HP and is in VP. Draw the projections of the line and find its inclination with VP.

33. A line PQ measures 80mm in length. The point P is above HP and infront of VP by 20 mm and 30mm respectively. The distance between the end projectors is 50 mm. The line is inclined to VP by 30^0. Draw the projections of the line and specify its true inclination with HP.

34. The top view of a line PQ 75 mm long measures 50 mm and the front view measures 60 mm. The end P is 30 mm above HP and 15 mm infont of VP. Draw the projections of the line and find its true inclinations with HP and VP. Find length of front view and distance between the end projectors.

35. The end A of a line AB is in HP and 25mm in front of VP. The end B is 25 mm infront of VP and 50mm above HP. The distance between the end projectors when measured parallel to the line of intersection of HP & VP is 65mm. Draw the projections of the line AB and determine its true length and true inclinations with HP & VP.

36. A line has its end A, 15mm from HP & 10 mm from VP. The end B is 55mm from HP and the line is inclined at 30^0 to HP. The distance between the end projectors is 50mm. Draw the projections of the line. Determine the true length of the line and its inclination with VP.

37. The end A of a line AB is in HP and 25mm in front of VP. The end B is 10 mm infront of VP and 50mm above HP. The distance between the end projectors when measured parallel to the line of intersection of HP & VP is 80 mm. Draw the projections of the line AB and determine its true length and true inclinations with HP & VP.

38. The top view of a line AB, 80mm long measures 65mm and the length of the front view is 50mm. The end A is on HP and 15mm infront of VP. Draw the projections

39. Draw the projections of a line PQ and find its apparent lengths, true length and true inclination with HP. When the line PQ has its end P 25 mm above HP and 20 mm infront of VP. The distance between the end projectors of the line when measured parallel to the line of intersection of the HP and VP is 60 mm. The end Q is 50 mm above the HP and the line is inclined at 30^0 to the VP.

40. A point P is 40 mm above HP and 20 mm infront of VP another point Q is 20 mm above HP and 50 mm infront of VP. The top view of line PQ is inclined at 30^0 to XY. Draw the projections.

MODULE -3. <u>PROJECTION OF PLANE SURFACES</u>

1. An equilateral triangular lamina of 25mm side lies with one of its edges on HP such that the surface of the lamina is inclined to HP at 60°. The edge on which it rests is inclined to VP at 60°. Draw the projections.

2. A triangular plane lamina of sides 25mm is resting on HP with one of its corners touching it, such that the side opposite to the corner on which it rests is 15mm above HP and makes an angle of 30° with VP. Draw the top and front views in this position. Also determine the inclination of the lamina to the reference plane.

3. An equilateral triangular lamina of 25mm side lies on one of its sides on HP. The lamina makes 45° with HP and one of its medians is inclined at 40° to VP. Draw its projections.

4. A triangular lamina of 25mm sides rests on VP on one of its corners on VP such that the median passing through the corner on which rests is inclined at 30° to HP and 45° to VP. Draw its projections.

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

6. The top view of a square lamia of side 30mm is a rectangle of sides 30mm x 20mm 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?

7. A rectangular lamina of sides 20mm x30mm rests on HP on one of its longer edges. The lamina is tilted about the edge on which it rests till its plane surface is inclined to HP at 45°. The edge on which it rests is inclined at 30° to VP. Draw the projections of the lamina.

8. A rectangular lamina of 35mm x 20mm 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 is inclined 30° to VP. Draw its projections and find its inclination to HP.

9. A pentagonal lamina of edges 25mm is resting on HP with one of its sides such that the surface makes an angle of 60°with HP. The edge on which it rests is inclined at 45° to VP. Draw its projections.

10. A pentagonal lamina having edges 25mm is placed on one of its corners on HP such that the perpendicular bisector of the edge passing through the corner on which the lamina rests is inclined at 30° to HP and 45° VP. Draw the top and front views of the lamina.

11. A pentagonal lamina having edges 25mm is placed on one of its corners on HP such that the surface makes an angle 30° with HP and perpendicular bisector of the edge passing through the corner on which the lamina rests appear to be inclined at 30° to VP. Draw the top and front views of the lamina.

12. A pentagonal lamina of sides 25mm is having a side both on HP and VP. The corner opposite to the side on which it rests is 15mm above HP. Draw the top and front views of the lamina.

13. A pentagonal lamina of edges 25mm is resting on VP with one of its sides such that the surface makes an angle of 60° with VP. The edge on which it rests is inclined at 45° to HP. Draw its projections.

14. A pentagonal lamina having edges 25mm is placed on one of its corners on VP such that the surface makes an angle 30° with VP and perpendicular bisector of the edge passing through the corner on which the lamina rests is inclined at 45° to HP. Draw the top and front views of the lamina.

15. Draw the top and front views of a hexagonal lamina of 30mm sides having two of its edges parallel to both vertical and horizontal planes and one of its edges is 10mm from each of the planes of projection. The surface of the lamina is inclined at an angle of 60°to the HP.

16. A hexagonal lamina of sides 30mm is resting on HP with one of its corners in VP and its surface inclined at an angle of 30°with VP. The diagonal passing through that corner which is in VP is inclined at 45° to HP. Draw the projections of the lamina.

17. **A** regular hexagonal lamina of sides 25mm is lying in such a way that one of its sides on HP while the side opposite to the side on which it rests is on VP. If the lamina makes 60°to HP, Draw the projections of the lamina.

18. **A** hexagonal lamina of sides 30mm has one of its corners in VP and its surface inclined at an angle of 30° with VP. The diagonal passing through that corner which is in VP appears to be inclined at 45° to HP. Draw the projections of the lamina.

19. Draw the projections of a circular plate of negligible thickness of 50mm 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 passing through the resting point makes 60° with VP.

20. A circular lamina of 30mm diameter rests on VP such that one of its diameters is inclined at 30° to VP and 45° to HP. Draw its top and front views in this position.

21. A triangular plane figure of sides 25mm is resting on HP with one of its corners, such that the surface of the lamina makes an angle of 60° with HP. If the side opposite to the corner on which the lamina rests make an angle of 30° with VP, draw the top and front views in this position.

22. A 30° - 60° setsquare of 60mm longest side is so kept such that the longest side is in HP, making an angle of 30° with VP. The setsquare itself is inclined at 45° to HP. Draw the projections of the setsquare.

23. An isosceles triangular plate of negligible thickness has base 25mm long and altitude 35mm. It is so placed on HP such that in the front view it is seen as an equilateral triangle of 25mm sides with the

side that is parallel to VP is inclined at 45° to HP. Draw its top and front views. Also determine the inclination of the plate with the reference plane.

24. A square lamina of 40mm side rests on one of its sides on HP. The lamina makes 30° to HP and the side on which it rests makes 45° to VP. Draw its projections.

25. A square lamina ABCD of 40mm side rests on corner A such that the diagonal AC appears to be at 45° to VP. The two sides AD and AB containing the corner A make equal inclinations with HP. The surface of the lamina makes 30° with HP. Draw its top and front views.

26. A rectangular lamina of 35mm x 20mm 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 is inclined 30° to VP. Draw its projections and find its inclination to HP.

27. A rectangular lamina of sides 20mm x 25mm has an edge in HP and adjoining edge in VP, is tilted such that the front view appears as a rectangle of 20mm x 15mm. The edge, which is in VP, is 30mm from the right profile plane. (a) Draw the top view, front view and the left profile view in this position. (b) Find its inclinations with the corresponding principal planes.

28. The front view of a rectangular lamina of sides 30mm x 20mm is square of 20mm sides. Draw the projections and determine the inclinations of the surface of the lamina with HP and VP.

29. A rectangular plate of negligible thickness of si~e 35x20mm has one of its shorter edges in VP with that edge inclined at 400 to HP. Draw the top view if its front view is a square of side 20mm.

30. A pentagonal lamina of edges 25mm is resting on HP with one of its corners such that the edge 'opposite to this corner is 20mm above HP & makes an angle of 45° with VP. Draw the top and front views of the plane lamina in this position. Determine the inclination of the lamina with HP.

31. A pentagonal lamina of edges 25mm is resting on HP with one of its corners such that the plane surface makes an angle of 60°with HP. The two of the edges containing the corner on which the lamina rests make equal inclinations with HP. When the edge opposite to this corner make an angle of 45° with VP and nearer to the observer, draw the top and front views of the plane lamina in this position.

32. A pentagonal lamina of sides 25mm is having a side both on HP and VP. The surface of the lamina is inclined at an angle of 60° with HP. Draw the top and front views of the lamina.

33. A regular pentagonal lamina of 25mm side is resting on one of its corners on HP while the side opposite to this corner touches VP. If the lamina makes an angle of 60°with HP and 30° with VP, draw the projections of the lamina.

34. A pentagonal lamina having edges 25mm is placed on one of its corners on VP such that the surface makes an angle 30° with VP and perpendicular bisector of the edge passing through the corner on which the lamina rests appears to be inclined at 30° to HP. Draw the top and front views of the lamina.

35. A hexagonal lamina of 30mm sides rests on HP with one of its corners touching VP and surface inclined at 45° to it. One of its edges is inclined to HP at 30°. Draw the front and top views of the lamina in its final position.

36. A regular hexagonal lamina of sides 30mm is lying in such a way that one of its sides touches both the reference planes. If the lamina makes 60° with HP, draw the projections of the lamina.

37. A regular hexagonal lamina of side 30mm is lying in such a way that one of its sides touches both the reference planes. If the side opposite to the side on which it rests is 45mm above HP, draw the projections of the lamina.

38. A regular hexagonal lamina of side 25mm is lying in such a way that one of its corners on HP while the corner opposite to the corner on which it rests is on VP. If the lamina makes 60° to HP, Draw the projections of the lamina.

39. A hexagonal lamina of sides 30mm has one of its corners in VP and its surface inclined at an angle of 30° with VP. The diagonal passing through that corner which is in VP appears to be inclined at 45° to HP. Draw the projections of the lamina.

40. A hexagonal lamina of sides 25mm rests on one of its sides on HP. The lamina makes 45° to HP and the side on which it rests makes 30° to VP. Draw its projections.

41. A hexagonal lamina of sides 25mm rests on one of its corners on HP. The lamina makes 45° to HP and the diagonal passing through the corner on which it rests is inclined at 30° to VP. Draw its projections.

42. A hexagonal lamina of sides 25mm rests on one of its corners on HP. The lamina makes 45° to HP and the diagonal passing through the corner on which it rests appears to be inclined at 30° to VP. Draw its projections.

43. A hexagonal lamina of sides 25mm rests on one of its sides on VP. The lamina makes 45° to VP and the side on which it rests makes 45° to HP. Draw its projections.

44. A hexagonal lamina of sides 25mm rests on one of its sides on VP. The side opposite to the side on which it rests is 30mm in front of VP & the side on which it rests makes 45° to HP. Draw its projections. Also determine the inclination of the lamina with the reference plane.

45. A hexagonal lamina of sides 25mm rests on one of its corners on HP. The corner opposite to the corner on which it rests is 35mm above HP and the diagonal passing through the corner on which it rests is inclined at 30° to VP. Draw its projections. Find the inclination of the surface with HP.

46. **A** circular lamina of 50mm diameter is standing with one of its points on the rim on HP and the lamina inclined at 45° to HP. The diameter at right angles to the diameter which is passing through the point on which the lamina rests is parallel to VP. Draw its projections.

47. A circular lamina inclined to the VP appears in the front view as an ellipse of major axis 30mm and minor axis 15mm. The major axis is parallel to both HP and VP. One end of the minor axis is in both the HP and VP. Draw the projections of the lamina and determine the inclination of the lamina with the VP.

48. A circular lamina of 30mm diameter rests on VP such that one of its diameters is inclined at 30° to VP and 45° to HP. Draw its top and front views in this position.

49. A square lamina of sides 35mm rests on one of its corners on HP such that the surface of the lamina makes 45° to HP. Draw its projections when the top view of the diagonal through the corner on which it rests appears perpendicular to VP. The sides containing the corner on which rests are equally inclined to HP.

50. A pentagonal lamina of sides 25mm is resting on one of its edges on HP with the corner opposite to that edge touching VP. This edge is parallel to VP and the corner, which touches VP, is at a height of 15mm above HP. Draw the projections of the lamina and determine the inclinations of the lamina with HP and VP and the distance at which the parallel edge lies from VP.

MODULE -4. <u>PROJECTION OF SOLIDS</u>

1. A pentagonal prism 25mm sides of base and 60mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30^0. Draw the projections of the prism when the axis is inclined to HP at 40^0.

2. A pentagonal prism 25mm sides of base and 50mm axis length rests on HP on one of its corners of the base such that the two edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40^0 and appear to be inclined VP at 45^0.

3. A hexagonal prism 25mm sides of base and 50mm axis length rests on HP on one of its edges of the base. Draw the projections of the prism when the axis is inclined to HP at 45^0 and VP at 30^0.

4. A pentagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its edges of the base. Draw the projections of the pyramid when the axis is inclined to HP at 45^0 and VP at 30^0.

5. A hexagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corners on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40^0 and VP at 30^0.

6. A square pyramid 35mm sides of base and 60mm axis length rests on HP on one its slant triangular faces. Draw the projections of the pyramid when the axis is inclined to VP at 45^0.

7. A pentagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45^0.

8. A pentagonal pyramid 35mm sides of base and 50mm axis length rests on HP on one its slant triangular faces. Draw the projections of the pyramid when the axis is inclined to VP at 45^0

9. A hexagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its slant triangular faces. Draw the projections of the pyramid when the axis is inclined to VP at 45^0.

10. A tetrahedron of 55mm sides rests on one of its corners such that an edge containing that corner is inclined to HP at 50^0 and VP at 30^0. Draw its projections.

11. A cube 40mm sides rests on HP on an edge which is inclined to VP at 35^0. Draw the projections when the lateral square face containing the edge on which it rests makes an angle 50^0 to HP

12. A cone of 50mm base diameter and 60mm axis length rests on HP on one of its generators when the axis inclined to VP 30^0

13. A square prism 35mm sides of baes and 65mm axis rests on HP on one of its edges of the base which is inclined to VP at 30^0. Draw the projections of the prism when the axis is inclined to HP at 45^0.

14. A square prism 35mm sides of baes and 60mm axis rests on HP on one of its corners of the base such that the two edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40^0 and appear to be inclined VP at 45^0.

15. A square prism 35mm sides of baes and 60mm axis rests on HP on one of its corners of the base such that the two edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40^0 and to be inclined VP at 30^0.

16. A square prism 35mm sides of baes and 60mm axis rests on HP on one of its edges of the base. Draw the projections of the prism when the axis is inclined to HP at 45^0 and VP at 30^0

17. A pentagonal prism 25mm sides of base and 60mm axis length rests on HP on one of its edges of the base. which is inclined to VP at 30^0. Draw the projections of the prism when the axis is inclined to HP at 40^0 and VP at 30^0

18. A pentagonal prism 25mm sides of base and 50mm axis length rests on HP on one of its corners of the base such that the two edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40^0 and appear to be inclined VP at 30^0

19. A hexagonal prism 25mm sides of base and 50mm axis length rests on HP on one of its edges of the base. Draw the projections of the prism when the axis is inclined to HP at 45^0 and appears to be inclined to VP at 40^0.

20. A hexagonal prism 25mm sides of base and 50mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corners on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at $40°$ and appears to be inclined to VP at 30^0.

21. A square pyramid 35mm sides of base and 65 mm axis length rests on HP on one its edges which is inclined to VP at 30^0. Draw the projections of the pyramid when the axis is inclined to HP at 45^0.

22. A square pyramid 35mm sides of base and 60mm axis length rests on HP on one of its corners of the base such that the two edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the pyramid is inclined to HP at 40^0 and appear to be inclined VP at 30^0

23. A square pyramid 35mm sides of base and 60mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the pyramid is inclined to HP at 40^0 and to VP at 30^0.

24. A square pyramid 35mm sides of base and 65mm axis length rests on HP on one of its edges of the base. Draw the projections of the pyramid when the axis is inclined to HP at 45^0 and VP at 30^0

25. A pentagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30^0. Draw the projections of the pyramid when the axis is inclined to HP at 40^0.

26. A pentagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corners on which it rests make equal inclinations

with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40^0 and appears to be inclined at VP at 45^0.

27. A pentagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corners on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40^0 and to VP at 30^0.

28. A hexagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30^0. Draw the projections of the pyramid when the axis is inclined to HP at 45^0.

29. A hexagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its edges of the base. Draw the projections of the pyramid when the axis is inclined to HP at 45^0 and VP at 30^0.

30. A hexagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corners on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40^0 and appears to be inclined at VP at 45^0.

31. A square pyramid 25mm sides of base and 60mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45^0.

32. A square pyramid 35mm sides of base and 60mm axis length rests on HP on one its slant edges. Draw the projections of the pyramid when the axis is inclined to VP at 45^0.

33. A square pyramid 25mm sides of base and 60mm axis length rests on HP on one of its slant triangular faces. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45^0.

34. A pentagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45^0.

35. A pentagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its slant triangular faces. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45^0.

36. A hexagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45^0.

37. A hexagonal pyramid 35mm sides of base and 50mm axis length rests on HP on one its slant edges. Draw the projections of the pyramid when the axis is inclined to VP at 45^0.

38. A hexagonal pyramid 25mm sides of base and 50mm axis length rests on HP on one of its slant triangular faces. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45^0.

39. A tetrahedron of 40mm sides rests on one of its sides on HP. This side is parallel to VP and 40mm away from it. It is tilted about resting side such that the base containing the edge is at $30°$ to HP. Draw its projections.

40. A hexahedron of 30mm sides is resting on one of its corners on HP such that one of its solid diagonals is perpendicular to VP. Draw the projection of the solid.

MODULE -5. <u>ISOMETRIC PROJECTIONS</u>

1. A sphere of diameter 50 mm rests centrally on top of a cube of sides 50 mm. Draw the isometric projection of the combination of solids.

2. The frustum of a square pyramid of base side 40 mm, top face 20 mm and height 60 mm rest on the center of the top of a square block of side 60 mm and height 20 mm. The base edges of the pyramid are parallel to the top edges of the square block. Draw the isometric projection of the combination of solids.

3. A sphere of diameter 30 mm rests on the frustum of a hexagonal pyramid of base 30 mm, top face 18mm side and height 50 mm, such that their axes coincide. Draw the isometric projection of the combination of solids.

4. Draw isometric projection of a hexagonal prism of side of base 40 mm and height 60 mm with a right circular cone of base 40 mm as diameter and altitude 50 mm resting on its top such that the axes of both the solids are collinear.

5. A rectangular pyramid of base 40 mm x 25 mm and height 50 mm is placed centrally on a cylindrical slab of diameter 80 mm and thickness 30 mm. Draw the isometric projection of the combination of solids.

6. A square prism of base side 40 mm, height 50 mm is placed centrally on a rectangular slab of sides 100mmx60mm and thickness 20 mm. Draw the isometric projection of the combination.

7. A hemisphere of diameter 70 mm is placed on the ground on its curved surface. A cone base diameter 70 mm and height 70 mm is placed centrally on it. Draw the isometric projection of the combination.

8. Draw the isometric projection of a rectangular prism of 60 x 80 x 20mm thick surmounting a tetrahedron of sides 45 mm such that the axes of the solids are collinear and at least one of the edges of both the solids are parallel to VP.

9. A pentagonal pyramid of base side 25 mm and height 65 mm is placed centrally on a rectangular slab 100 mm x 60 mm thick. Draw the isometric projection of the combination.

10. A triangular pyramid base side 40 mm and height 50 mm is placed centrally on a square slab side 80mm and 20 mm thick. Draw the isometric projection of the combination.

11. Two rectangular slabs are placed one above the other coaxially with dimensions (l x b x h) 100 mm x 60 mm x 20 mm and 100 mm x 40 mm x 20 mm such that the longer edges are parallel to VP. Draw the isometric projection of the combination.

12. Three cubes of sides 60 mm, 40 mm and 20 mm are placed centrally one above the other in descending order of their side. Draw the isometric projection of the combination.

13. A cone of base diameter 50 mm and height 50 mm is placed centrally on an equilateral triangular prism of side 100 mm and 20 mm thick. Draw the isometric projection of the combination.

14. Following figures shows the front and side views of the solid. Draw the isometric projection of the solid.
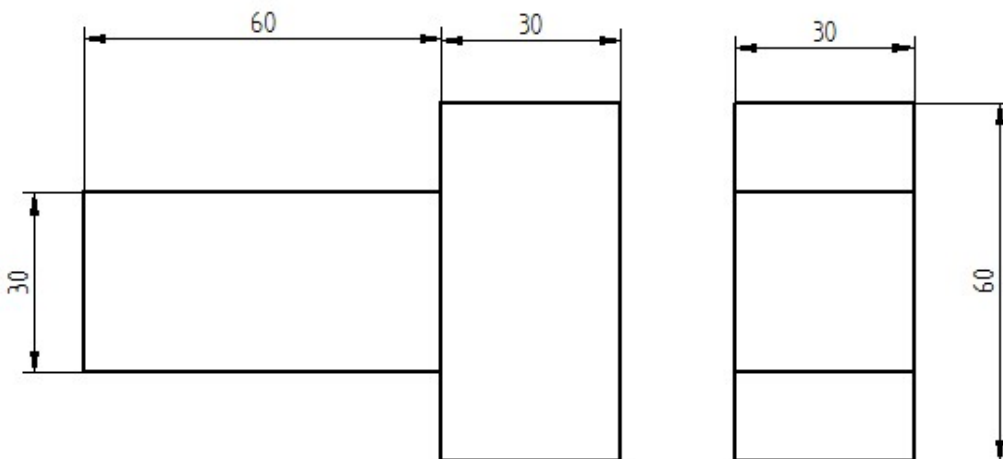

FIG.1
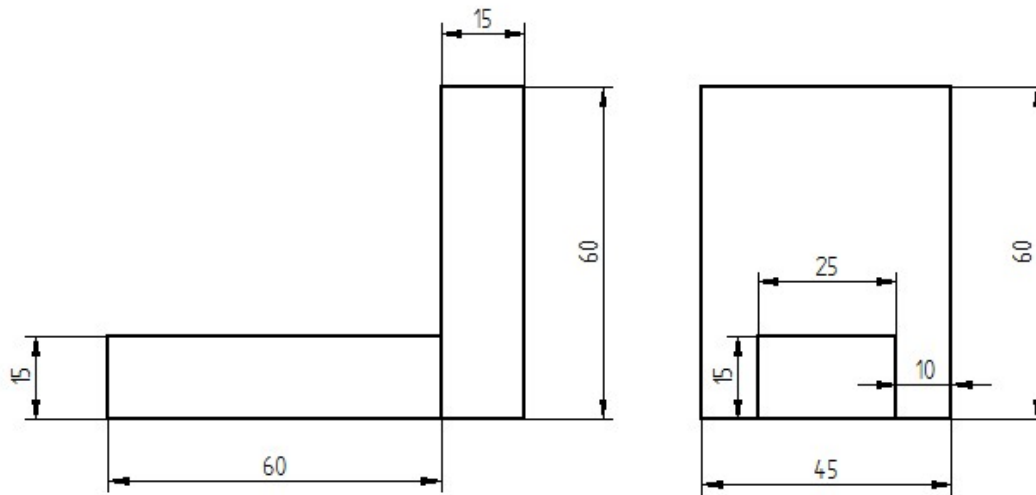
FIG.2
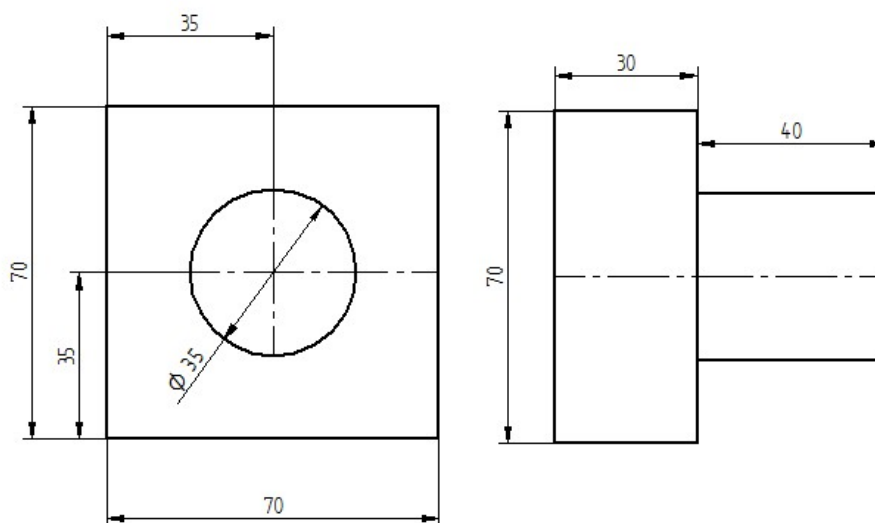
FIG.3

15. A hemisphere of 40mm diameter is supported coaxially on the vertex of a cone of base diameter 60mm and axis length 50mm. The flat circular face of the hemisphere is facing upside. Draw the isometric projection of the combination of solids.

16. A regular pentagonal prism of base edge 30mm and axis 60mm is mounted centrally over a cylindrical block of 80mm diameter and 25 mm thick. Draw isometric projection of the combined solids.

17. A pentagonal pyramid of base side 30mm and axis length 60mm is resting on HP on its base with a side of base perpendicular to VP. Draw its isometric projections.

18. A cone of base diameter 30mm and height 40mm rests centrally over a cube of side 50mm. Draw the isometric projection of the combination of solids.

19. A cone of base diameter 40mm and height 50mm rests centrally over a frustum of a pentagonal pyramid of base side 45mm and top side 35mm and height 55mm. Draw isometric projection of the solids.

20. A sphere of diameter 45mm rests centrally over a frustum of cone of base diameter 60mm, top diameter 40mm and height 60mm. Draw its isometric projections.

21. A hemisphere of diameter 50mm is centrally resting on top of a square of base side 60mm and height 30mm such that the curved surface of a hemisphere is touching the top face of the prism. Draw its isometric projections.

22. A cone of base diameter 50mm and height 40mm is placed centrally on the top face of a square slab side 80mm and height 20mm. Draw the isometric projections of the combination.

23. A rectangular pyramid of base 40mm x 25mm and height 50mm is placed centrally on a rectangular slab of side 100mm x 60mm and thickness 20mm. Draw the isometric projection of the combination of solids.

24. A square prism base side 40mm, height 50mm is placed centrally on a cylindrical slab of diameter 10mm and thickness 30mm. Draw the isometric projection of the combination.

25. A frustum of cone base diameter 50mm, top diameter 25mm and height 50mm is placed centrally on a cylindrical slab of diameter 100mm and thickness 30mm. Draw the isometric projection of the combination.

26. A frustum of a cone base diameter 50mm, top diameter 25mm and height 50mm is placed centrally on square slab side 80mm and thickness 30mm. Draw the isometric projection of the combination.

27. A hemisphere diameter 50mm is resting on its curved surface centrally on the top of frustum of a rectangular pyramid base 80mm x 60mm and top 60mm x 40mm, height 55mm. Draw the isometric projection of the combination.

28. A cone of base diameter 45mm and height 65mm is placed centrally on the top face of a pentagonal prism side 45mm and height 35mm. Draw the isometric projection of the combination.

29. A sphere of diameter 40mm is placed centrally on the flat face of the a hemisphere diameter 60mm. Draw the isometric projection of the combination.

30. A triangular prism base side 30mm and length 70mm is resting on its rectangular face on top of a square slab side 70mmand 25mm thick. Draw the isometric projection of the combination.