Short Questions

1. Classify types of Conics.
2. Name the different types of lines used in Engineering Graphics
3. Difference between Plane and Solid
4. Differentiate between Cone and Cylinder
5. Define Isometric projection.
6. List different line types used in engineering drawing.
7. What are the four methods of projection are used in engineering drawing?
8. List the different types of planes.
9. 'What is meant by section plane?
10. 'What is an isometric axis?
11. Write freehand the following. using single stroke vertical capital letters of 5 mm (h size "**ENGINEERING GRAPHICS IS THE LANGUAGE OF ENGINEERS**"
12. Define Epicycloid and Hypocycloid.
13. What do you mean by traces of a Line? Define HT and VT
14. When do you use an Auxiliary plane?
15. Differentiate Frustum and Truncated solids.
16. What is a Section plane? How do you get the true shape of a section?
17. What are the methods of development of Surfaces?
18. Differentiate Isometric drawing and Isometric projection.
19. Define Ellipse
20. Differentiate First angle projection and Third angle projection.
21. Differentiate Hyperbola from parabola.
22. What are the different types of Projections? What are the different types of conic sections?
23. What are the different methods of Development?
24. What is isometric Projection?
25. Name cycloidal curves.
26. What do you understand by Reference plane?
27. Where do you find the application of auxiliary planes? Give two examples.
28. What is the difference between cone and prism?
29. What do you understand by isometric scale?
30. What are the Dimensions of A1,A2,A3 and A4 Drawing sheet?

31. The Internal angle of Pentagon and Hexagon are degree

32. Mention different types of solids.

33. What is meant by Sectioning of solid?

34. Isometric projections of Sphere and Circle are

35. The Length: Width ratio in case of an arrow head is?

36. In epicycloid curve is Straight line, what are the diameters of Generating and directing circles?

37. Write down the symbol used in First angle projection.

38. In line inclined to both the planes, FV and TV are vertical lines. What are the angles made with HP and VP?

39. Isometric projections of sphere and circle are

40. Define the term Eccentricity.

41. What do you understand about First angle and Third angle projections?

42. State the Similarities and Dissimilarities in the projections of points which lie in the second-angle and the fourth-angle.

43. Define Cylinder and cone in terms of surface of revolution.

44. How to construct an Isometric scale?

45. Name different Conic sections.

46. What is the difference between Orthographic projection and Isometric projection?

47. What is Axi-symmetric plane?

48. What is the front view of a cone whose base is resting on HP?

49. What is an Isometric scale?

50. Define the terms ellipse, parabola and hyperbola.

51. Distinguish between projection and traces.

52. Define the terms frustum and truncated.

53. List out the methods of development.

54. Why 30° angle is used in isometric projection?

55. Differentiate between Isometric and Orthographic projections.

56. Classify different types of solids.

57. Construct a pentagon with a side of 25 mm.

58. Define the term Eccentricity.

59. What do you understand about First angle and Third angle projections?

60. State the Similarities and Dissimilarities in the projections of points which lie in the second-angle and the fourth-angle.

61. Define Cylinder and cone in terms of surface of revolution.
62. How to construct an Isometric scale?

Unit-1 Geometrical Constructions, Conic sections

1. Draw a straight-line AB of any length. Mark a point F, 65 mm from AB, take e-2/3 name the curve. Draw a normal and tangent to the curve at a point 50 mm from F.

2. A fixed point is 80 mm from a fixed straight line. Draw the locus of a point p moving in such a way that its distance from the fixed straight lines twice its distance from the fixed point. Name the curve.

3. Construct a Hyperbola when its abscissa is 35mm and double ordinate is 90mm and half transverse axis is 45mm.

4. Construct an Ellipse when the distance of the focus from the directrix is equal to 50mm and eccentricity is 2/3.

5. Construct a hyperbola with its foci 70 mm apart and the major axis as 40 mm. Draw a tangent and Normal to the curve at a point 20 mm from the focus.

6. Draw involute of circle of 40 mm diameter and draw tangent and normal to the curve from any point on the curve.

7. Construct a parabola when the distance between the focus and directrix is 30mm. Also draw the tangent and normal to any point on the curve.

8. Draw the locus of a point that moves in such a way that the ratio of its distance from a fixed point to a fixed straight line is 2/3. The actual distance between the fixed line and the fixed point is 50 mm. Draw a tangent and a normal to the curve at a point 70 mm away from the fixed straight line.

9. A circular disc of 28 mm diameter is wounded by a tight string. To draw the locus of free end point of the string it is gradually unwound clockwise. Construct involute of circle.

10. Construct a parabola using rectangle method with base 60mm and length of the axis 40mm. Draw tangent to the curve at a point 20mm from the base. Also, locate the focus and directrix to the parabola.

11. A coir is unwound from a drum of 30 mm diameter. Draw the locus of the free end of the coir for unwinding through an angle of 360°. Name the curve and draw also a normal and tangent at any point on the curve.

12. A coir is unwound from a drum of 30 mm diameter. Draw the locus of the free end of the coir for unwinding through an angle of 360°. Name the curve and draw also a normal and tangent at any point on the curve.

13. Construct an ellipse of 120 mm major axis and 80 mm minor axis using concentric circle methods.

14. Construct a hexagon of side 28 mm when one side is vertical.

15. Construct an ellipse with major axis 90mm and minor axis 60mm by arcs of circles method.

16. A wheel of 50 mm diameter rolls without slipping on a straight flat surface. Trace the locus of the point of contact for one complete revolution of the wheel.

17. A circle of 72 mm diameter rolls along a straight line without slipping. Draw the curve traced out by a point P on the circumference, for one complete revolution of the circle. Name the curve. Draw tangent and normal to the curve at a point N on it 62 mm from the straight line.

18. A fixed point is 90 mm from a fixed straight line. Draw the locus of a point P moving in such a way that its distance from the fixed straight line is twice its distance from the fixed point. Name the curve. Draw a tangent and a normal at a point 40 mm away from the fixed point.

19. Draw a parabola given that the distance between the directrix and focus is 4cm, Draw tangent and normal to the curve at any point on the curve.

20. A regular pentagonal plate of 20 mm side is fixed at its centre. An inelastic rope is circumscribed along the Perimeter of the pentagonal plate. Draw the path of the free end of the rope when it is unwounded keeping, tight for one complete revolution.

21. When cricket a ball was thrown, it reached a maximum height of 7 m and fell on the ground at a distance of 16 m from the point of projection. Draw the path of the ball, calculate the angle of projection and name the curve.

22. Draw a straight-line AB of any length. Mark a point F, 65 mm from AB, take e-2/3 name the curve. Draw a normal and tangent to the curve at a point 50 mm from F.

23. Two straight lines OA and OB make an angle of 75° between them. P is a point 40 mm from OA and 50 mm from OB. Draw a hyperbola through P, with OA and OB asymptotes, marking at least 10 points.

24. A fixed point is 80 mm from a fixed straight line. Draw the locus of a point p moving in such a way that its distance from the fixed straight lines twice its distance from the fixed point. Name the curve.

25. Construct an ellipse, with distance of the focus from the directrix as 50 mm and eccentricity as 2/3. Also draw normal and tangent to the curve at a point 40 mm from the directrix.

26. Draw the involute of a circle of 40 mm diameter. Also draw a tangent and a normal to the curve at a point 95 from the centre of the circle.

27. Draw an involute to a circle of diameter 50 mm. Also draw a tangent and normal to the curve at any point.

28. A circle of 5 mm diameter rolls along a straight line without slipping. Draw the curve traced out by a point P on the circumference, for one complete revolution of the circle. Name the curve. Draw a tangent to the curve at a point on it 40 mm from the line.

29. A point P is 15 mm below HP and 25 mm in front of VP. Another point Q is 25 mm above HP and 15 mm behind VP. The distance between the end projectors is 60 mm. Draw the projections and join the line joining their plans and elevations.

30. Construct a regular hexagon with a side of 30 mm by general method.

31. Construct an ellipse when the distance of the focus from the directrix is equal to 80 mm and eccentricity is 3/5.

32. A point A is situated in the first quadrant. Its shortest distance from the intersection points of H.P., V.P, and auxiliary vertical planes is 50mm and it is equidistant from the principal planes. Draw the projections of the point and determine its distance from the principal planes.

Unit -2: Projection of straight lines

1. A 60 mm long line AB is parallel to and 20 mm in front of the V.P. The ends A and B are 10 mm and 50 mm above the H.P. respectively. Draw the projections of the line and determine its inclination with the H.P.

2. Draw the projections of a 70 mm long line PQ, situated in V.P. and inclined at 30° to the H.P. The end P of the line is 25 mm above the H.P.

3. Draw the projections of a 75 mm long straight line, perpendicular to the HP, in the VP and its one end in the HP.

4. A point D is 25 mm below the HP and 25 mm behind the VP. Draw its projections.

5. A line IJ 50 mm long has its end I 30 mm above the HP and 25 mm in front of VP. The line is kept inclined at 40° to HP and parallel to VP. Draw its projections and make its traces.

6. Project the following points

   A, 28mm below HP and 35mm behind VP

   B, 35mm above HP and 40mm behind VP

   C, 30mm above HP and 45mm in front of VP

   D, 30mm above HP and 40mm behind VP

   E, 30mm below HP and on VP

7. Produce the projections of a line AB which is 70mm long inclined at an angle of 30° to HP and parallel to VP. Point 'A' is 20mm above HP and 30mm in front of VP.

8. A point A is situated in the first quadrant. Its shortest distance from the intersection points of H.P., V.P, and auxiliary vertical planes is 50mm and it is equidistant from the principal planes. Draw the projections of the point and determine its distance from the principal planes.

9. Draw the projections of a 70 mm long line PQ, situated in V.P. and inclined at 30° to the H.P. The end P of the line is 25 mm above the H.P.

10. A 60 mm long line AB is parallel to and 20 mm in front of the V.P. The ends A and B are 10 mm and 50 mm above the H.P. respectively. Draw the projections of the line and determine its inclination with the H.P.

11. Mark the projections of the following points on a common reference line, keeping the projectors 35 mm apart. (i) 25 mm above the HP and 40 mm behind the VP (ii) 20 mm above the HP and on the VP (iii) 30 mm below the HP and 45 mm in front of the VP.

12. Draw the projection of a 75mm long straight line, in the following positions Inclined at 30° to the HP and its one end 20mm above it: parallel to and 30 mm in front of the V.P.

13. A line AB, 90 mm long, is inclined at 30° to the HP. Its end A is 12 mm above the HP and 20 mm in front of the VP. ls front view measures 65 mm. Draw the top view of AB and determine its inclination with the VP.

14. The front view of 75mm long line measures S5mm. the line in parallel to the HP. and one of its ends is in the VP. and 25mm above the HP. draw the projections of the line and determine its inclination with the VP.

15. A line AB. 90 mm long. is inclined at 45° to the HP and its top view makes an angle of 60° with the VP. The end A is in the HP and 12 mm in front of the VP. Draw its front view and find its true inclination with the VP.

16. A thin circular plate of 70 mm diameter is resting on its circumference such that its plane is inclined 60° to the HP and 30° to the VP. Draw the projections of the plate.

17. 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 the VP.

18. A line RS 40 mm long is parallel to both the planes. It is 20 mm above the HP and 15mm in front of the VP. Draw the projections of the line.

19. Draw the projections of a line 65mm long parallel to and 20mm in front of V.P and in the H.P.

20. Draw the projection of the following points along a common reference line. (i) Point A 20mm below HP and 25mm behind VP. (ii) Point B 25mm away from the reference planes and is in IV quadrant. (iii) Point C 20mm above HP and the same distance behind VP.

21. The front view of a line AB, 80 mm long, measures 55 mm while its top view measures 70 mm. End A is in both HP and VP. Draw the projections of the line and find its inclinations with the reference planes.

22. A point P is 15mm above the H.P and 20mm in front of the V.P. another point Q is 25mm behind the V.P and 40mm below the H.P. Draw projections of P and Q keeping the distance between their projections equal to 90mm. Draw the straight lines joining (i) their top view and (ii) their front views.

23. A line AB 60mm long is inclined 45° to HP and parallel to VP. Such that point A is 15mm above HP and 20mm in front of VP. Draw its projectors.

24. A line AB, inclined at 40° to the V.P. has its end 50mm and 20mm above the H.P. the length of its front view is 65mm and its V.T. is 10mm above the H.P. Determine the true length of AB its inclination with the H.P. and its H.T.

25. The front view of a line PQ measures 70 mm and is inclined at 30° to the reference line. The end P is on the H.P and V.T of the line is 15 mm below the H.P. The line is inclined at 45° to the V.P. Draw the projections of the line and find its true length, inclination with the H.P and locate the H.T.

26. Two points A and B are in the H.P. The point A is 30 mm in front of the VP, while B is behind the V.P. The distance between their projections is 75 mm and line joining

their top views makes an angle of 45° with XY. Find the distance of the point B from the V.P

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

28. The distance between the projectors of two points A and B is 70mm. Point A is 10mm above H.P and 15mm in- front of VP. Point B is 50mm above HP and 40mm in front of VP. Find the shortest distance between A and B. measure true inclination of the line AB with HP and VP.

29. Produce the projections of a line AB which is 70mm long inclined at an angle of 30° to HP and parallel to VP. Point 'A' is 20mm above HP and 30mm in front of VP.

30. Produce the projections of a pentagonal plate of side 25mm is resting with one of its sides on HP and its inclined at 45° to HP.

31. Produce the projections of a regular hexagon of 25mm side, having one of its sides in the H.P. and inclined at 60° to the V.P.

32. Draw the projections of the following points on a common reference line.
    i)   P 35 mm behind the VP and 20 mm below the HP.
    ii)   Q 40 mm infront the VP and 30 mm above the HP.
    iii)   R 50 mm behind the VP and 15 mm above the HP.
    iv)   S 40 mm below the HP and in the VP.
    v)   T 30 mm infront of the VP and 50 mm below the HP.

33. Line AB is 55 mm long and it is 25° & 45^0 inclined to HP & VP respectively. End A is 15 mm above HP and 15 mm in front of VP. Draw projections. Line is in 1st quadrant.

34. A 120 mm long line PQ is inclined at 45° to the H.P and 30 to the V.P. The mid-point of PQ is 20 mm above the H.P and 40 mm in front of the V.P. Draw the projections of the line and determine its traces.

35. A line PQ is parallel to the VP and inclined 30° to the H.P. End P is 20 mm from both the reference planes and the top view measures 70mm. Draw the projections of the line and determine its true length.

36. The distance between the projectors of two points A and B is 70mm. Point A is 10mm above H.P and 15mm in- front of VP. Point B is 50mm above hp and 40mm in front of VP. Find the shortest distance between A and B. measure true inclination of the line AB with HP and VP.

37. Two points P and Q are in the H.P. The point P is 40 mm M in front of the VP, while Q is behind the V.P. The distance between their projections is 85 mm and line joining their top views makes an angle of 45° with XY. Find the distance of the point Q from the VP.

Unit -3 Projections of planes and Solid

1. The top view of a square plane of diagonal 80 mm appears as a rhombus of 80 mm and 50 mm diagonals. One of the corners of the plane is in the H.P. Draw its projections when one of the diagonals is parallel to both the principal planes.

2. A right regular pentagonal prism, 25 mm edge of base and 55 mm height rests on an edge of its base in H.P. such that its axis is parallel to V.P. and inclined to the H.P. at 45°. Draw the projections of the solid.

3. A hexagonal pyramid, base 25 mm side and axis 50 mm long has an edge of its base on the ground. Its axis is inclined at 40° to the ground and parallel to the V.P. Draw its projections.

4. A hexagonal plane of 25 mm side has one side on the ground. The surface of the plane is inclined at 45° to the H.P. and perpendicular to the V.P. Draw its projections.

5. A square plane ABCD of 30 mm side has its surface parallel to H.P. and 20 mm away from it. Draw its projections of the plane when two of its sides are.
   (a) Parallel to V.P
   (b) Inclined at 30° to V.P

6. Draw a cone, base 40 mm diameter and axis 50 mm long resting on the HP on their respective bases.

7. Draw a cylinder, base 40 mm diameter and axis 50 mm long resting on the HP on their respective bases.

8. A rectangular plane surface of size 30 mm and 60 mm is positioned in the first quadrant and is inclined at an angle of 60° with the H.P. and 30° with the V.P. Draw its projections.

9. A pentagonal pyramid, with side of base 30 mm and axis 60 mm long, is resting with its base on H.P. and one of the edges of its base is perpendicular to V.P. it is cut by a section plane, parallel to H.P. and passing through the axis at point 35 mm above the base. Draw the projections of the remaining solid.

10. A cone of base 50 mm diameter and axis 60 mm long is resting on its base on H.P. it is cut by a section plane perpendicular to V.P. and parallel to an extreme generator and passing through a point on the axis at a distance of 20 mm from the apex. Draw the development of the retained solid.

11. A square pyramid of 35mm side and 60mm height rests on one of its triangular faces on the HP, such that the base edge is inclined at 40° to VP. Draw the projections of pyramid. When the apex is nearer to viewer?

12. A line AB, inclined at 40° to the V.P., has its ends 50 mm and 20 mm above the H.P. The length of its front view is 65 mm and its V.T. is 10 mm above the H.P. Determine the true length of AB, its inclination with the H.P. and its H.T.

13. A square plane ABCD of 30 mm side has its surface parallel to HP and 20 mm away from it. Draw its projections of the plane when two of its sides are inclined at 30° VP.

14. A regular hexagon of 40 mm has a corner in the HP. Its surface is inclined at 45° to the HP and the top view of the diagonal through the corner which is in the HP makes an angle of 60° with the VP. Draw its projections.

15. Produce the projections of a Hexagonal pyramid, base 25mm side and axis 50mm long, resting with its base on V.P. and one of its triangular faces is parallel to H.P.

16. Produce the projections of a pentagonal prism, base 25mm side and axis 50mm long, resting with its base on V.P. and one of its rectangular faces is parallel to H.P.

17. A square ABCD of 50mm side has its comer A in the HP. Its diagonal AC inclined at 30° to the HP, and the diagonal BD inclined at 45° to the VP and parallel the HP. Draw its projections.

18. Draw the projections of a circle of S0mm diameter resting in the HP on a point A on the circumference, its plane inclined at 45° to the HP and
    (a) The top view of the diameter AB making 30^0 angle with the VP.
    (b) The diameter AB making 30°angle with the VP.

19. Draw the projections of a cube of 25 mm long edges resting on the HP on one of its comers with a solid diagonal perpendicular to the VP.

20. Produce the projections of a pentagonal plate of side 25mm is resting with one of its sides on HP and its inclined at 45° to HP.

21. Produce the projections of a regular hexagon of 25mm side, having one of its sides in the H.P. and inclined at 60° to the V.P.

22. A regular pentagon of 30 mm sides is resting on HP, on one of its sides with its surface 45° inclined to HP. Draw its projections when the side in HP makes 30° with VP?

23. A square plane ABCD of 30 mm side has its surface parallel to H.P. and 20 mm away from it. Draw its projections of the plane when two of its sides are.

                i)   Parallel to V.P ii) Inclined at 30° to V.P

24. A hexagonal plane of 25 mm side has one side on the ground. The surface of the plane is inclined at 45° to the H.P. and perpendicular to the V.P. Draw its projections.

25. A right regular pentagonal prism, 25 mm edge of base and 55 mm height rests on an edge of its base in H.P. such that its axis is parallel to V.P. and inclined to the H.P. at 45°. Draw the projections of the solid.

26. A hexagonal pyramid, base 25 mm side and axis 50 mm long has an edge of its base on the ground. Its axis is inclined at 40° to the ground and parallel to the V.P. Draw its projections.

27. A square prism, side of base 30 mm and axis 50 mm long. has its axis inclined at 60° to HP. It has an edge of its base in the HP and inclined at 45° to VP. Draw its projections.

28. A lamp shade is formed by cutting a cone of base 144 mm diameter and 174 mm height by a horizontal plane at a distance of 72 mm from the apex and another plane inclined at 30° to HP, passing through one extremity of the base. Develop the surface of the shade.

29. A hexagonal prism with side of base 25 mm and 50 mm long is resting on a corner of its base on HP. Draw the projections of the prism when its axis is making 30° with HP and parallel to V.P.

30. Draw the projections of a cylinder 75 mm diameter and 100 mm long. Lying on the ground with its axis inclined at 30° to the VP and 45° inclined to HP.

31. A Square prism, having a base with a 35mm side and an 60mm long axis, rests on one of its base edges in the HP such that the axis is inclined at 45° to the HP and 45° to the VP. Draw its projections, if the resting edge makes an angle of 30° with VP?

32. A circular lamina of diameter 60 mm has a point of its circumference in the V.P. Its surface is inclined to V.P such that the front view appears as an ellipse having minor and major axes in the ratio of 1:2. Draw its projections when the major axis is inclined at 30° with the H.P.

33. A cylinder of base diameter 50 mm and axis 70 mm long is resting on one of its generators on the H.P. Draw its projections when the axis is inclined at 30° to the V.P.

34. A hexagonal pyramid of base side 30mm and axis height 50mm is resting on HP on one of its base corners with its axis parallel to VP. Draw its projections when the slant edge containing the resting corner is vertical.

35. A cone of base diameter 40mm and altitude 50mm rests on its base on the HP. It is cut by a plane inclined at 45° to HP and passes through a point on axis which is 20mm above HP. Draw the front view, sectional top view and true shape of the section.

36. A cylinder 65 mm diameter and 90 mm long has its axis parallel to the H.P. and inclined at 30° to the V.P. It is cut by a vertical section plane in such a way that the true shape of the section is an ellipse having the major axis 75 mm long. Draw its sectional front view and true shape of the section.

37. A pentagonal prism, 30 mm base side & 50 mm axis is standing on HP on its base with one side of the base perpendicular to VP. It is cut by a section plane inclined at 45° to the HP, through midpoint of axis. Draw true shape of section and Development of surface of remaining solid.

Unit -4 Section of solids

1. A cylinder of 40mm diameter, 60mm height and having its axis vertical, is cut by a section plane, perpendicular to the VP. inclined at 45° to the HLP. and intersecting.

2. A hexagonal pyramid, side of base 25 mm and axis 50 mm long, rests with its base on HP and an edge of its base is perpendicular to VP. It is cut by a section plane perpendicular to VP, inclined at 30° to HP and passing through a point on the axis 20 mm below the apex. Draw the sectional side view and sectional top view.

3. A square prism with a base having 40 mm sides and height 60 mm is kept on its base on the H.P. such that one of its rectangular faces makes an angle of 30° with V.P. It is cut by a section plane parallel to V.P. such that the true shape of the section is a rectangle with 30 mm and 60 mm sides. Draw its sectional front view and top view.

4. A pentagonal pyramid has a base side of 30mm and axis height of 70mm. It rests with its base on HP such that one of the base edges perpendicular to VP. The pyramid is cut by a plane which bisects the axis and is inclined at 30° to HP. Draw the development of the remaining portion of the pyramid.

5. A cylinder of diameter of base 40 and axis 55 long is resting on its base on HP. It is cut by a section plane. perpendicular to VP and inclined at 45° to the HP. The section plane is passing through the top end of an extreme generator of the cylinder. Draw the development of the lateral surface of the cut cylinder

6. A cylinder of base diameter 50 mm and axis 70 mm is lying, on a generator on the HP with its axis parallel to the VP. It is cut by an AIP, inclined at 30° to the HP passing through a point on the axis 30 mm from one of its ends. Draw its sectional top view and obtain true shape of the section.

Unit -5 Isometric Views and Orthographic Views

1. A frustum of a cone has its top and bottom diameters 35 mm and 50 mm respectively and altitude 53 mm. It rests on the top face of a frustum of a square pyramid. The sides of the top and bottom faces of the pyramid are 58 mm and 70 mm respectively, the height being 22 mm. Draw the isometric view.

2. A pentagonal prism of base side 25 mm and axis 80 mm is placed centrally on its rectangular face over a square block of base side 60 mm and thickness 30 mm. Draw the isometric projection of the arrangement.

3. Draw an isometric view of a pentagonal prism of base side 30 mm and axis 60 mm resting on its base in with a face parallel and nearer to the V.P.

4. The frustum of a pentagonal pyramid with base side 30mm and top surface of 15mm side has a height of 40mm. draw its isometric view. Draw the isometric projection of a hexagonal pyramid side of base 40 mm and height 60 mm lies on H.P.

5. Draw an isometric view of a pentagonal prism having a base with 30 mm side and 60 mm long axis, resting on its base in H.P. with a face parallel and nearer to the V.P.

6. A sphere of radius 18mm is placed centrally over a 12 hexagonal slab of side 24mm and thickness 25mm. Draw the isometric view of the combined solid.

7. Produce the projections of a Hexagonal pyramid, base 25mm side and axis 50mm long, resting with its base on V.P. and one of its triangular faces is parallel to H.P.

8. Produce the projections of a pentagonal prism, base 25mm side and axis 50mm long, resting with its base on V.P. and one of its rectangular faces is parallel to H.P.

9. Draw the isometric projection of a hexagonal pyramid side of base 40 mm and height 60 mm lies on H.P.

10. Draw an isometric view of a pentagonal prism having a base with 30 mm side and 60 mm long axis, resting on its base in H.P. with a face parallel and nearer to the V.P.

11. Draw a isometric projection of the frustum of a hexagonal pyramid of base side 40 mm top side 25 mm and height 70 mm the frustum rests on the base on the HP.

12. A pentagonal prism of base side 25 mm and axis 80 mm is placed centrally on its rectangular face over a square block. of base side 60 mm and thickness 30 mm. Draw the isometric projection of the arrangement.

Draw the Isometric view of the following angular bracket shown in fig.1 and show the dimensions.
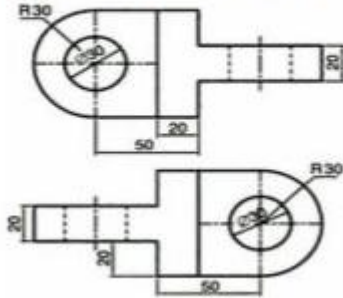
Draw the Isometric view object shown in of the following orthographic views and show the dimensions.

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