INDIAN SCHOOL MUSCAT

SENIOR SECTION

DEPARTMENT OF ENGINEERING GRAPHICS

CLASS XII

UNIT-1 ISOMETRIC PROJECTION OF SOLIDS (WORKSHEET)

SINGLE SOLIDS

1. Draw the isometric projection of a cube of 50 mm side when it rests on HP on one of square faces such that two of the base edges are parallel to VP.
2. Draw the isometric projection of a hexagonal pyramid base side 40 mm and height 65 mm rests on HP on its base such that two of the base edges are parallel to and nearer to VP.
3. Draw the isometric projection of a pentagonal prism 35 mm side and 55 mm axis length rests on HP on one of its rectangular faces such that its axis is parallel to both HP and VP.
4. A frustum of a cone with its base diameters of 60 mm in front and 40 mm at the back, length of axis being 75 mm, is having its axis perpendicular to VP. Draw its isometric projection. Give all dimensions.
5. A square prism 30 mm side and 65 mm height rests on HP on its base such that its axis perpendicular to HP and two base edges parallel to VP. Draw its isometric projection. ***[H]***
6. A square pyramid base side 40 mm and axis 80 mm length rests on HP on its base such that the base edges are equally inclined to VP and its axis perpendicular to HP. Draw its isometric projection.
7. Draw the projection of a pentagonal prism of 30 mm base side and 65 mm of axis. The axis of the prism is perpendicular to HP and one of its base edges is perpendicular to VP. ***[H]***
8. Draw its isometric projection of a pentagonal pyramid of base side 30 mm and axis of 60 mm resting on its base on H.P with one of its base side parallel to VP and nearer to the observer.
9. Draw the isometric projection of an inverted pentagonal pyramid of base side 30 mm and axis of 60 mm resting on its base on H.P. with one of its base side parallel to VP and nearer to the observer.
10. A right triangular pyramid of base edge 50 mm and axial height of 80 mm is kept on its base keeping one of its base sides parallel to VP and away from it. Draw its isometric projection.
11. Draw the isometric projection of an inverted triangular pyramid of base side 50 mm and axis of 80 mm keeping one of its base sides parallel to VP and nearer to the observer. ***[H]***
12. Draw the isometric projection of an inverted hexagonal pyramid of base edge 30 mm and height of 60 mm keeping two of its base side parallel to the VP.
13. Draw the isometric projection of a frustum of a square pyramid of shorter base edge 30 mm and longer base edge 50 mm with the axial length of 60 mm, kept on HP on its shorter end and two of its base edges are parallel to VP. ***[H]***
14. Draw the isometric projection of frustum of pentagonal pyramid having longer base side 40 mm and shorter base side 30 mm with axis of 70 mm resting on its longer side base keeping one of its base side parallel to the VP and nearer to the observer.
15. Draw the isometric projection of a cylinder of diameter 40 mm and axial length of 70 mm lying on the HP keeping its axis parallel to HP and VP both.
16. Draw the isometric projection of an inverted cone of diameter 50 mm and axis of 80 mm keeping its axis perpendicular to HP.
17. Draw the isometric projection of a sphere of diameter 50 mm.
18. Draw the isometric projection of a hemisphere of 60 mm diameter resting on its curved surface on HP.

COMIBNATION SOLIDS

19. Draw an isometric projection of a sphere resting centrally on a rectangular face of a horizontal hexagonal prism having its hexagonal ends perpendicular to VP. Side of hexagon = 30 mm, length of the prism = 80 mm and diameter of sphere = 60 mm.
20. Draw an isometric projection of hemisphere resting centrally on its curved surface, on the top horizontal rectangular face of an equilateral triangular prism, keeping two triangular faces parallel to the VP. Side of equilateral triangle = 50 mm, length of the prism = 70 mm and diameter of the hemisphere = 60 mm.
21. Draw an isometric projection of 32 mm cube resting centrally on the top face of an equilateral triangular prism having 50 mm base side and height = 30 mm. one rectangular face of the prism is away from the observer and kept parallel to the VP. ***(H)***
22. Draw an isometric projection of a square pyramid resting vertically and centrally on the top pentagon face of a pentagonal prism, having one rectangular face parallel to VP while closer to the observer. Side of the square base = 30 mm, height of the pyramid = 50 mm, side of the pentagon = 34 mm and height of the prism = 52 mm.

23. Draw an isometric projection of a vertical regular pentagonal pyramid resting centrally, having one base edge away from the observer parallel to VP on top of a vertical cylinder. Side of the pentagon = 32 mm, height of the pyramid = 50 mm, diameter of cylinder = 76 mm and height of the cylinder = 40 mm.
24. Draw an isometric projection of a right circular cone resting vertically and centrally on the top horizontal rectangle of a pentagonal prism having its axis parallel to HP and VP both. Side of the pentagon = 34 mm, length of the prism = 80 mm, diameter of the cone = 44 mm and height of cone = 60 mm.
25. A pentagonal prism of edge 20 mm and axis length 25 mm is rests centrally on the top of cylindrical disc of diameter 80 mm and height 20 mm. the prism is resting on one of its rectangular faces and its axis is perpendicular to VP. The axis of the disc is perpendicular to HP. Draw the isometric projection of the combination of the solids. Give all dimensions.
26. Construct the isometric projection of a hemisphere of diameter = 80 mm, resting on HP with its curved surface on it and top circular face, parallel to HP. The axis is perpendicular to HP. Draw the axis, making the center of its circular face and its height from HP. Give dimensions.
27. A square prism of base edge 80 mm and height 30 mm is resting on HP with its square base on it. One of the base edges of the prism is parallel to VP. A hexagonal pyramid of base edge 30 mm and height 70 mm is placed centrally on its top square face with its hexagonal base on it. One of the base edges of the pyramid is parallel to VP. Draw the isometric projection of the solids, placed together, to isometric scale. Draw the common axis and show the direction of viewing. Give all dimensions.
28. Construct the isometric projection to isometric scale of a hexagonal pyramid of base edge 30 mm and height 80 mm, keeping it in the inverted position. The axis is perpendicular to HP. One base edge is perpendicular to VP. Draw the axis and indicate the direction of viewing. Give all dimensions.
29. A cylinder (diameter = 50 mm and height = 70 mm) is placed centrally, with its circular end on the pentagonal face of a pentagonal prism (base edge = 40 mm and height = 30 mm). The common axis perpendicular to H.P. The base of the prism is on HP and one of its base edges is parallel to VP and away from it. Draw the isometric projection of the solids, placed together, to isometric scale. Draw the common axis and indicate the direction of viewing. Give all dimensions.
30. Construct the isometric projection to isometric scale, of a frustum of an equilateral triangular pyramid, kept in the inverted position (base edge = 30 mm, top edge = 60 mm and height = 50 mm) , with its triangular end of 30 mm side, resting on HP. One of the top edges and one of the base edges are parallel to HP and VP and are away from VP. Give all dimensions. Draw the axis and indicate the direction of viewing.
31. A hemisphere (diameter = 70 mm) is centrally placed, with its circular face up, on a hexagonal prism (base edge = 30 mm and height = 40 mm), on its hexagonal face. Two of its opposite base edges of the hexagonal face on HP are perpendicular to VP. The common axis is perpendicular to HP and parallel to VP. Draw the isometric projection of the two solids, placed together, to isometric scale. Draw the common axis and indicate the direction of viewing. Give all dimensions.
32. Construct the isometric projection to isometric scale of a frustum of a cone whose bottom diameter is 50 mm and top diameter is 70 mm and the height equals 80 mm. It is resting on HP on its circular base of diameter 50 mm. Give all dimensions. Indicate the direction of viewing.
33. An equilateral triangular pyramid base side 40 mm and height 70 mm is centrally placed on its base keeping one of its base side's perpendicular to VP on the pentagonal end of a regular pentagonal prism, whose base side is 50 mm and height 30 mm. One of the base sides of the prism is kept parallel to VP and away from it. The common axis is perpendicular to HP and parallel to VP. Draw the isometric projection of the two solids, placed together, to isometric scale. Give all dimensions.
34. Construct an isometric projection of a frustum of a pentagonal pyramid of base side 40 mm, top side 30 mm and height of axis 60 mm. when resting on HP with its base on it, one of its base sides is perpendicular to VP and the axis is perpendicular to HP. Give dimensions.
35. A hexagonal prism with base side 30 mm and height 40 mm is resting on HP on its hexagonal base. One of its base sides is parallel to VP. On the top hexagonal end, a sphere of 25 mm radius is centrally placed. Taking their common axis perpendicular to HP. Draw the isometric projection of the two solids. Give all dimensions.
36. Construct an isometric projection of a hemisphere of diameter 90 mm having its circular face parallel to HP on the upper side. Give all dimensions.
37. A cone with base diameter 50 mm and height 80 mm, is centrally placed with is circular base on the square top surface (top side 60 mm) of the frustum of a square pyramid (bottom side 80 mm) and height 70 mm keeping the common axis vertical and two parallel sides of the bottom surface of the frustum, parallel to VP, draw the isometric projection of the solids, placed together. Give all dimensions.
38. A hemisphere of diameter 84 mm is having its circular face parallel to HP on the upper side. A regular pentagonal prism of base side 24 mm and height 55 mm is resting centrally on it, with a base side away from the

observer, parallel to VP and their common axis perpendicular to HP. Draw its isometric projection. Give all dimensions. ***(H)***

39. A frustum of a regular hexagonal pyramid, base side 28 mm, top side 16 mm and height of frustum 60 mm is having its base side parallel to VP and axis perpendicular to HP. Draw its isometric projection and give all dimensions. ***(H)***
40. A regular hexagonal prism of base side 30 mm and length 72 mm is resting on one of its rectangular faces on HP, with axis parallel to HP and VP. Draw its isometric projection and give dimensions. ***(H)***
41. A frustum of an equilateral triangular pyramid, base side 58 mm, top side 32 mm and height of frustum 65 mm is having a base side parallel to VP and nearer to observer. It is centrally placed on top of a cylindrical disc of base diameter 90 mm and height 48 mm, resting on its base on HP. Draw its isometric projection keeping their common axis vertical. Give dimensions. ***(H)***
42. A frustum of a hexagonal pyramid (smaller side 20 mm, bigger side 30 mm and axial height 60 mm) is resting on its smaller hexagonal face in the HP with the edge of that face, farther from the observer, being parallel to the VP and 40 mm from it. A sphere of 20 mm radius is kept centrally over the top larger face of the frustum. Draw the isometric scale and isometric projections of the combined solids. Give dimensions. ***(H)***
43. A frustum of a cone, top diameter 76 mm, bottom diameter 40 mm and height 65 mm, rests on its smaller base on HP. An equilateral triangular prism of base side 36 mm and height 45 mm with a rectangular face at the back parallel to VP rests centrally on it, keeping their common axes perpendicular to HP. Draw the isometric projection of the solids. Give dimensions. ***(H)***
44. A hexagonal prism of base edge 24 mm and axial height 60 mm is resting on one of its rectangular faces on the HP with the axis kept horizontal and parallel to the VP. A square pyramid of base edge 40 mm and axial height 50 mm is placed centrally on its base and on the top rectangular face of the prism, with one base edge parallel to the VP. Draw the isometric scale and also the isometric projection of the combined solids. Give all dimensions.
45. A cylindrical disc of base diameter 80 mm and height 45 mm is resting on its base on the HP. A regular pentagonal prism of base edge 25 mm and height 60 mm with a base side parallel to VP and nearer to observer rests centrally on the top end of the disc, keeping their common axis perpendicular to the HP. Draw the isometric projection of the combined solids. Draw the isometric scale. Give all dimensions. ***(H)***
46. A Hexagonal prism of base edge 30 mm and axial height 30 mm is resting on one of its rectangular faces in HP and axis perpendicular to VP. A cylinder of 24 mm diameter and axial length 30 mm is resting centrally on its circular base over the top rectangular face of the prism. Draw the isometric projection of the combined solids. Draw the isometric scale. Give all dimensions. ***(H)***
47. A cylindrical disc of base diameter 80 mm and height 35 mm rests on its base on the HP. A frustum of an equilateral triangular pyramid, base edge 50 mm, top edge 30 mm and height of frustum 55 mm, with a base edge parallel to the VP and close to the observer, rests centrally on the top end of the disc, their common axis being perpendicular to the HP. Draw the isometric projection, giving all dimensions. ***(H)***
48. A hemisphere of 25 mm radius is resting on its curved surface centrally over the top face of frustum of a square pyramid (top edge 30 mm, bottom edge 60 mm and axial height 50 mm). The frustum is resting on its base in HP and base edges are equally inclined to VP. Draw the isometric scale and isometric projection of combined solids. Give all dimensions. ***(H)***
49. A frustum of a cone, top diameter 40 mm, bottom diameter 60 mm and height 60 mm, is placed centrally on a square prism of 80 mm sides and height 40 mm. Draw the isometric scale and isometric projection of the solids. Give all the dimensions. ***(H)***
50. A triangular prism of each side 35 mm and height 35 mm has one rectangular face parallel to VP. It is placed centrally on the flat face of a frustum of a cone having top diameter 60 mm, bottom diameter 40 mm and height 45 mm. The common axis is perpendicular to HP and parallel to VP. Draw the isometric scale and isometric projection of the solids. Give dimensions. ***(H)***
51. A circular cylinder of diameter 40 mm and length 55 mm is placed centrally with its axis horizontal on one of its rectangular faces of a square prism with sides 20 mm and length 70 mm also lying horizontally on one of its rectangular faces. Draw the isometric scale and the isometric projection of solids.
52. A frustum of a cone with top diameter 30 mm, bottom diameter 40 mm and height 35 mm is centrally on the triangular face of a triangular prism, having one rectangular face parallel to VP and away from it. The common axis is perpendicular to HP and parallel to VP. The prism has each side 80 mm and height is 30 mm.
53. A frustum of a pentagonal pyramid with top sides 35 mm, bottom sides 25 mm and height 55 mm is placed with one of its base edges parallel to VP and nearer to it. A sphere of diameter 50 mm is placed over the frustum. The common axis is perpendicular to HP and parallel to VP. Draw the isometric scale and isometric projection of the combined solids. Give all dimensions. ***(H)***

54. A hemisphere of 25 mm radius is resting on its curved surface centrally over the top face of a rectangular prism of base edges 50 mm X 35 mm and height 40 mm. the prism rests on HP on its end face with two longer base edges parallel to the VP. Draw the isometric scale and isometric projection of the combined solids. Give all the dimensions.
55. A hemisphere of 30 mm radius is resting on its flat surface centrally over a hexagonal prism of base edges 40 mm and axis length 60 mm. the prism has its axis parallel to both the VP and the HP. Draw the isometric scale and isometric projection of combined solids. Give all the dimensions.
56. A triangular prism 35 mm side and 82 mm axis length, rests on HP on one of its longer edges such that the rectangular face at the top is parallel to HP and the axis of the prism is perpendicular to VP. A square pyramid of base side 56 mm and axis length 60 mm is centrally placed over the prism on its vertex (apex), with its axis perpendicular to HP and two base edges parallel to VP. Draw the isometric projection of the combination of solids.
57. A hexagonal prism of base sides 33 mm, and height 60 rests on its rectangular face on the HP with axis perpendicular to the VP. A square prism of base edges 42 mm and axis length 60 mm is placed centrally over the hexagonal prism with its axis parallel to both the VP and HP. Draw the isometric scale and isometric projection of the combined solids. Give all the dimensions. ***(H)***
58. A triangular of base side 35 mm and height 45 mm is resting on HP on its base and has one rectangular face parallel to VP and nearer to it. A pentagonal prism of base sides 30 mm and height 55 mm rests centrally over the triangular prism with its axis parallel to both HP and VP. Draw the isometric scale and isometric projection of combined solids. Give all the dimensions.
59. A hexagonal prism of base sides 30 mm and axis 55 mm is resting on HP on its base with the base edges perpendicular to VP. A square prism of base edges 32 mm and axial length 55 mm is placed centrally over the prism with its axis perpendicular to VP. Draw the isometric scale and isometric projection of the combined solids. Give all the dimensions. ***(H)***
60. A cylinder of base diameter 50 mm and axis height 65 mm is resting on its base on HP. A pentagonal prism of base edges 26 mm and height 70 mm is placed centrally over the prism with its axis perpendicular to the VP. Draw the isometric scale and isometric projection of the combined solids. Give all the dimensions.
61. A triangular prism of base sides 35 mm and axis 60 mm is resting on HP with a rectangular face parallel to VP and nearer to it. A hexagonal prism of base sides 28 mm and axis 50 mm is placed centrally over the end face of the triangular prism with its axis perpendicular to VP. Draw the isometric scale and isometric projection of the combined solids. Give all the dimensions. ***(H)***
62. A frustum of a cone, top diameter 65 mm, bottom diameter 30 mm and height 55 mm, rests on its smaller base on HP. A cylinder of base diameter 45 mm and axis height 60 mm rests centrally on the frustum, with the axis perpendicular to the VP. Draw the isometric projections of the solids. Give all dimensions. ***(H)***
63. The frustum of a pentagonal pyramid of sides 20 mm at the base and 40 mm at the top end of height 70 mm rests on HP with its axis perpendicular to the HP. A rectangular prism of base edges 50 mm x 35 mm and height 50 mm is placed centrally over the frustum with its axis perpendicular to the VP and the longer base edge is parallel to both HP and VP. Draw the isometric scale and isometric projections of the solids. Give all dimensions.
64. A cylindrical disc of base diameter 60 mm and height 35 mm is resting on its base on the HP. A regular pentagonal pyramid of base edge 25 mm and height 55 mm with a base side parallel to VP and nearer to observer rests centrally on the top end of the disc, keeping their common axis perpendicular to the HP. Draw the isometric projection of the combined solids. Draw the isometric scale. ***(H)***
65. A cube of base sides 40 mm rests on its base on HP. A triangular prism of base sides 32 mm and axis 50 mm with a base side perpendicular to VP is placed centrally over the cube with its axis perpendicular to HP. Draw the isometric projection of the combined solids. Draw the isometric scale.
66. A square prism of base edges 36 mm and axial height 56 mm is resting on its base on the HP. A frustum of a cone, top diameter 50 mm, bottom diameter 36 mm and height 56 mm, is placed centrally over the prism with its axis perpendicular to HP. Draw the isometric projection. ***(H)***
67. A hexagonal prism of base side 25 mm and height 50 mm has a square hole of side 16 mm at the center. The axes of the hole and prism are perpendicular to the HP and parallel to VP. One of the faces of the square hole is parallel to the face of the hexagon. Draw the isometric projection. ***(H)***
68. A square pyramid with sides 30 mm and height 35 mm is placed over a hemisphere of 25 mm radius which is resting on its curved surface on HP. Draw the isometric projection. ***(H)***
69. Three square prisms of sides 30 mm and height 60 mm, placed together to form the letter 'I'. Draw the isometric projection. ***(H)***
70. A pentagonal prism of base sides 28 mm and axis 65 mm is resting on HP on its base. A square pyramid of base edge 40 mm and axial height 50 mm is placed centrally on its base over the prism. Draw iso projections. ***(H)***

71. A triangular prism of each side 35 mm and height 50 mm has one rectangular face parallel to VP and nearer to the observer. A cylinder of base diameter 40 mm and axis height 60 mm is placed centrally over the prism with its axis perpendicular to the VP. Draw the isometric projections.
72. A hexagonal prism of base edge 26 mm and axial height 60 mm is resting on one of its rectangular faces in the HP with axis perpendicular to VP. A rectangular prism of base edges 50 mm X 35 mm and height 40 mm is placed centrally over the hexagonal prism with its axis parallel to both HP and VP. Draw the isometric projection. ***(H)***
73. A pentagonal prism of base sides 26 mm and axis 60 mm is resting on HP with its axis perpendicular to HP and one of the base sides parallel to VP and away from it. A hexagonal prism of base edge 24 mm and axial height 50 mm is resting on one of its rectangular faces over the pentagonal prism with its axis parallel to both HP and VP. Draw the isometric projection. ***(H)***
74. A hexagonal pyramid base side 32 mm and axis length 66 mm is placed centrally over a triangular prism of base side 86 mm and height 40 mm such that their common axis is perpendicular to HP. Two base edges of the pyramid are parallel to VP and one of the base edges of the prism is parallel to VP and nearer to the observer. Draw the isometric projection of solids. ***(H)***
75. Construct an isometric projection to isometric scale of the frustum of a regular hexagonal pyramid, having its axis vertical and two base edges parallel to VP. The top edge = 20 mm, base edge = 40 mm and height = 80 mm. give all dimensions. Draw the axis and indicate the direction of viewing. ***(H)***
76. A sphere of diameter 80 mm is resting centrally on its curved surface on top of a vertical pentagonal prism, having its base edge = 40 mm and height = 80 mm, keeping one of its rectangular face, in front, parallel to the VP. Draw an isometric projection. ***(H)***
77. Construct an isometric projection of the frustum of a cone, having its axis perpendicular to the HP. The top diameter = 40 mm and base diameter = 50 mm and height of frustum is 70 mm. Give all dimensions.
78. A square pyramid of 30 mm base edge and 60 mm high with two base edges parallel to VP, is centrally placed on the top face of a triangular prism of base edge 50 mm and height 40 mm is resting on the HP having vertical axis with one base edge, in front, parallel to VP. Draw an isometric projection of the combination of solids.
79. A cone of base diameter 40 mm and axis height 75 mm held in such a way that its axis is perpendicular to VP and the base is nearer to the observer. Draw its isometric projection.
80. The axis of a pentagonal pyramid 30 mm base side and 70 mm height is perpendicular to VP and one of the base edges parallel to HP and away from it. The base of the pyramid is nearer to VP. Draw its isometric projection.
81. Draw an isometric projection of the frustum of an equilateral triangular pyramid with base edge 50 mm, top edge 40 mm and height 70 mm. It is resting on HP on its base with one of the base edges parallel and nearer to the VP. The axis is perpendicular to HP. Give all the dimensions.
82. A cylinder of diameter 50 mm and height 60 mm is placed centrally on the top surface of a pentagonal prism (base edge 40 mm and height 25 mm). the common axis is perpendicular to HP. One of the base edges of the prism is parallel to VP and is nearer to the observer. Draw the isometric projection of the solids.
83. A pentagonal pyramid base edge 35 mm and axis length 65 mm held on VP on its base such that the axis is perpendicular to VP. One of the base edges is parallel to HP and away from it. Draw its isometric projection.
84. A pentagonal pyramid (base edge 30 mm and height 70 mm) is placed centrally on the top triangular face of a triangular prism (base side 90 mm and height 30 mm) with its pentagonal base on the prism. One base side of the pyramid is parallel to VP and away from it. One side of the base of the prism is parallel to VP and closer to the observer. Draw the isometric projection of the solids placed together.