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QUESTION BANK
ENGINEERING DRAWING
(**19KBEDR24**)

PROJECTION OF POINTS (Each Question Carries 10 Marks)

1. A point P is 45 mm above HP, 60 mm behind VP and 30 mm from RPP. Draw the three principles view of the point. Also state the quadrant in which it lies.

2. Draw the projections of the following points on the same XY line, keeping convenient distance between each projectors. Name the quadrants in which they lie.
   - E - 30 mm below HP and 25 mm behind VP.
   - F - 35 mm above HP and 40 mm behind VP.
   - G - On HP and 30 mm in front of VP.
   - H - On HP and 35 mm behind VP.

3. A point 30 mm above XY line is the front view of two points A and B. The top view of A is 40 mm behind VP and the top view of B is 45 mm in front of VP. Draw the projections of the points and state the quadrants in which the points are situated.

4. A point 30 mm above XY line is the front view of 3 points P,Q and R. The top view of R is 40 mm behind VP, the top view Q is on XY line and top view of point P is 45 mm in front of VP. Draw the projections of the points and state the quadrants in which the points are situated.

5. A point 20 mm below the reference XY line is the top view of three points P,Q and R. P is 20 mm below HP, Q is 35 mm above HP and R is on HP. Draw the projections of the three points and state their positions and quadrants in which they are situated.

6. A point A is 20 mm above HP and 25 mm in front of VP. Another point B is 25 mm behind VP and 40 mm below HP. Draw their projections when the distance between their projectors parallel to XY line is zero mm. Add the right side view only to point B.

7. A point P is on HP and 35 mm in front of VP. Another point Q is on VP and below HP. The line joining their front views makes an angle of 30 deg. to XY line, while the line joining their top views makes an angle of 45 deg. with XY line. Find the distance of the point Q from HP.

8. A point M is on HP and 30 mm in front of VP. Another point N is 20 mm below HP and 20 mm in front of VP. The distance between their projectors measured parallel to XY line is 50 mm. Find the distance between front views of the point M and N.

9. Two points R and S are on HP. The point R is 35 mm in front of VP, while S is 50 mm behind VP. The line joining their top views makes an angle of 40 deg. with XY. Find the horizontal distance between the two projectors.

10. Two points P and Q are on HP. The point P is 30 mm behind VP, while Q is 50 mm in front of VP. The line joining their top views makes an angle of 40 deg. with XY. Find the horizontal distance between their projectors parallel to XY line.

PROJECTION OF LINES (Each Question Carries 20 Marks)

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

2. 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 deg. to HP and 40 deg. to VP. Draw its top and front views.

3. Draw the projections of a line AB 100 mm long inclined at 45° to VP and 30° to HP. One end of the line is 20 mm above HP and in VP. Determine apparent lengths and inclinations.

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

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

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

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

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

9. A line PQ 85 mm long has its end P 10 mm above HP and 15 mm in front of 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.

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

PROJECTION OF PLANES (Each Question Carries 30 Marks)

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

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

3. A 30 - 60 deg. set square of 60 mm longest side is so kept such that the longest side is in HP making an angle of 30 deg. with VP. The set square itself is inclined at 45 deg. to HP. Draw the projections of the set square.

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

5. A rectangular lamina of sides 20 mm X 30 mm 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 deg. The edge on which it rests is inclined at 30 deg. to VP. Draw its projections of the lamina.

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

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

8. A square lamina ABCD of 40 mm side rests on corner C such that diagonal AC appears to be at 45 deg. to VP. The two sides BC and CD containing that corner C make equal inclination with HP. The surface of the lamina makes 30 deg. with HP. Draw its top and front views.

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

10. Draw the projections of a circular plate of negligible thickness of 50 mm diameter resting on HP on a point A on the circumference, with its plane inclined at 45 deg. to HP and the top view of the diameter passing through the resting point makes 60 deg. with VP.

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

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

13. A rectangular lamina of 35 mm X 20 mm rests on HP 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 at 30 deg. to VP. Draw its projections and find its inclination to HP.

14. A rectangular lamina of 35 X 20 mm rests on HP on one of its shorter edges. The lamina is rotated about the edge on which it rests till it appears as a square in the top view. The edge on which the lamina rests being parallel to both HP and VP. Draw its projections and find its inclinations to HP and VP.

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

16. A regular hexagonal lamina of side 30 mm 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 45 mm above HP. Draw the projections of the lamina.

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

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

PROJECTION OF SOLID (Each Question Carries 40 Marks)

PYRAMIDS

1. A hexagonal pyramid 25mm sides of base and 50mm axis length rest 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.

2. A square pyramid 35mm sides of base and 65mm axis length rest 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.

3. A pentagonal pyramid 25mm sides of base and 50mm axis length rest 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 appears to be inclined to VP at 40^0.

4. A square pyramid 35mm sides of base and 60mm axis length rest 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 pyramid when the axis of the pyramid is inclined to HP at 40^0 and appears to be inclined to VP at 45^0.

5. A pentagonal pyramid 25mm sides of base and 60mm axis length rest 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 pyramid when the axis of the pyramid is inclined to HP at 40^0 and appears to be inclined to VP at 30^0.

6. A hexagonal pyramid 25mm sides of base and 60mm axis length rest 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 pyramid when the axis of the pyramid is inclined to HP at 40^0 and appears to be inclined to VP at 30^0.

7. A square pyramid 35mm sides of base and 60mm axis length rest on HP on one of its slant edges. Draw the projection of the pyramid when the axis appears to be inclined to VP at 45^0.

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

9. A square pyramid 35mm sides of base and 60mm axis length rest on HP on one of its slant triangular faces. Draw the projection of the pyramid when the axis appears to be inclined to VP at 45^0.

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

PRISMS

11. A square prism 35mm sides of base and 65mm 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 45^0.

12. 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.

13. A pentagonal prism 25mm sides of base and 60mm 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 40^0 and appears to be inclined to VP at 30^0.

14. A square prism is 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 prism is inclined to HP at 40^0 and appears to be inclined to VP at 45^0.

15. 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 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 appears to be inclined to VP at 45^0.

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

ISOMETRIC PROJECTION (Each Question Carries 30 Marks)

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

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

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

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

5. A hemisphere 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.

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

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

8. The frustum of a square pyramid of base 40 mm, top face 20 mm and height 60 mm rest on the centre of the top of a square block of sides 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 the solids.

9. A square prism base side - 40 mm, height 50 mm is placed centrally on a cylindrical slab of diameter 100 mm and thickness 30 mm. Draw the isometric projection of the combination.

10. A square prism side - 40 mm and height 70 mm has a full depth co-axial square hole side - 20 mm, such that edges of both the squares are parallel. Draw the isometric projection of the combination.

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

DEVELOPMENT OF SOLIDS (Each Question Carries 30 Marks)

1. A triangular prism with one of its rectangular faces parallel to VP and nearer to it is cut as shown in fig.1. Draw the development of the retained portion of the prism which are shown in dark lines.

2. A square prism of base side 30 mm and axis length 60 mm is resting on HP on its base with all the vertical faces being equally inclined to VP. It is cut by an inclined plane 60 deg. to HP and perpendicular to VP and is passing through a point on the axis at a distance 50 mm from the base. Draw the development of the lower portion of the prism.

3. A Square prism of base side 40 mm and axis length 65 mm is resting on HP on its base with all the vertical faces being equally inclined to VP. It is cut by an inclined plane 60 deg. to HP and perpendicular to VP and is passing through a point on the axis at a distance of 15 mm from the top

face. Draw the development of the lower portion of the prism.

4. A cube of side 40 mm is resting on HP with its base on HP such that one of its vertical faces is inclined at 30 deg. to the VP. It is cut by a section plane perpendicular to VP, inclined to HP at an angle 45 deg. and passes through the mid-point of the axis. Draw the development of the lower lateral surface of the cube.

5. A rectangular prism of base 40 mm X 25 mm and height 65 mm rests on HP on its base with the longest base side inclined at 30 deg. to VP. It is cut by a plane inclined at 40 deg. to HP, perpendicular to VP cuts the axis at its mid height. Draw the development of the remaining portion of the prism.

6. A rectangular prism of base 30 mm X 20 mm and height 60 mm rests on HP on its base with the longer base side inclined at 40 deg. to VP. It is cut by a plane inclined at 45 deg. to HP, perpendicular to VP and bisects the axis. Draw the development of the lateral surface of the prism.

7. A rectangular prism of base size 25 mm X 40 mm and axis length 65 mm is resting on HP on its base with the longer side of base inclined at 30 deg. to VP. It is cut by a plane inclined at 40 deg. to HP and perpendicular to VP and passes through the extreme left corner of base. Draw the development of the lateral surface of the remaining portion of the prism.

8. A regular pentagonal prism of height 60 mm and base edge 30 mm rests with its base on HP. The vertical face closest to VP is 30 deg. to it. Draw the development of the truncated prism with its truncated surface inclined at 60 deg. to its axis and bisecting it.

9. A pentagonal prism of 30 mm side of base and height 50 mm lies with its base on HP such that one of the rectangular faces is inclined at 40 deg. to VP. It is cut to the shape of truncated pyramid with the truncated surface inclined at 30 deg. to the axis so as to pass through a point on it 30 mm above the base. Develop the truncated portion of the prism so as to produce a one piece development.

10. The inside of a hopper of a flour mill is to be lined with thin sheet. The top and bottom of the hopper are regular pentagons with each side equal to 30 mm and 22.5 mm respectively. The height of the hopper is 30 mm. Draw the shape of the sheet to which it is to be cut so as to fit into the hopper.

11. A square pyramid of side of base 45 mm, altitude 70 mm is resting with its base on HP with two sides of the base parallel to VP. The pyramid is cut by a section plane which is perpendicular to the VP and inclined at 40 deg. to the HP. The cutting plane bisects the axis of the pyramid. Obtain the development of the lateral surfaces the truncated pyramid.

12. A square pyramid base 40 mm side and axis 65 mm long has its base on HP and all the edges of the base are equally inclined to VP. It is cut to with an inclined section plane so as the truncated surface at 45 deg. to its axis, bisecting it. Draw the development of the truncated pyramid.

13. A frustum of a square pyramid has its base 40 mm sides, top 16 mm sides and height 60 mm, its axis is vertical and a side of its base is parallel to VP. Draw the projections of the frustum and show the development of the lateral surfaces of it.

14. A rectangular pyramid, side of base 25 mm x 40 mm and height 50 mm has one of the sides of the base is inclined at 30 deg. to the VP. Draw the development of the lateral surface of the cut pyramid, whose front view is shown below Fig (7).

15. A square pyramid of 25 mm base edge and 50 mm height rests with its base on HP with all of its base edges equally inclined to VP. It is cut by a plane perpendicular to VP and inclined to HP at 60 deg., passing through the extreme right corner of base. Draw the development of the lateral surface of the pyramid.