.

Part – A Questions

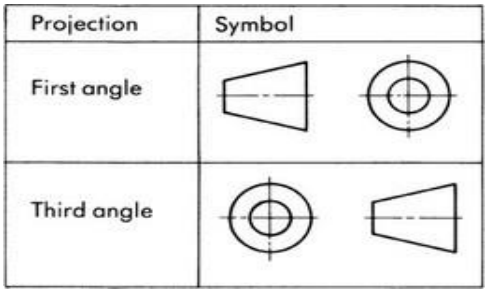
1Define eccentricity.

Ans). Eccentricity is the ratio of distance of the point from the focus to the distance of the point from directrix. (e = PF/PD)

2What is meant by orthographic projections?

Ans).When the projectors (straight lines) drawn from the object are parallel to each other and perpendicular to the plane of projection, it is called as orthographic projection

3. Draw the standard notation for 1st angle and 3rd angle projection.Ans).



4. What is Representative fraction?

Ans). The ratio of the length of the drawing to the actual length of the object represented is called theRepresentative Fraction (R.F**)**

5.) What is the difference between plain scale and diagonal scale?

Ans). Plain Scale is used to measure two consecutive Units of measurement and Diagonal Scale is used to measure three consecutive units of measurement

6. What is the eccentricity Values for different conic sections**?**

Ans) Eccentricity is defined as **the ratio of the distance of point from the focus to the distance of point from the directrix and it is denoted by e**

Eccentricity for parabola is 1 Eccentricity for Ellipse is E < 1 Eccentricity for Hyperbola is E > 1

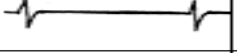
7. Define conic .

Ans). It is a locus of point moving in a plane in such a way that the ratio of its distances from a fixed point (focus) and a fixed line (directrix) is always constant

8) Define Involute?

Ans) Involute is defined as the curve traced by the end of a thread as it is unwound around a line,polygon or a circle, the thread being kept tight.

9. Explain with sketches the various types of lines used in drawing.
   A. The following is the list of lines and their uses in drawing:

Line		Description	General Application	
A		Continuous thick	A1 A2	Visible outlines. Visible edges.
B		Continuous thin (straight or curved)	B1 B2 B3 B4 B5 B6 B7	Imaginary lines of intersection. Dimension lines. Projection lines. Leader lines. Hatching lines. Outlines of revolved sections in place. Short centre lines
C		Continuous thin free hand	C1	Limits of partial or interrupted views and sections, If the limit is not a chain thin.
D		Continuous thin (straight) with zigzags	D1	Long break line
E		Dashed thick	E1 E2	Hidden outlines. Hidden edges.
F		Dashed thin	F1 F2	Hidden outlines. Hidden edges.
G		Chain thin	G1 G2 G3	Center lines. Lines of symmetry. Trajectories
H		Chain thin, thick at ends and changes of direction	H1	Cutting planes.
J		Chain thick	J1	Indication of lines or surfaces to which a special requirement applies
K		Chain thin double dashed	K1 K1 K3 K4 K5	Outlines of adjacent parts. Alternative or extreme position of movable parts. Centroidal lines. Initial outlines prior to forming Parts situated in front of the cutting plane

10)What is the difference between 1st angle and 3rd angle projection.
Ans).

	1stangle projection	3rd angle projection
1	Object is placed inthe 1st quadrant	Object is placed in the3rd quadrant
2	Object lies in between the observer and the plane of projection	The plane of projectionlies in between the observer and the object
3	The plane of projection is assumedto be transparent	The plane of projectionis assumed to be non-transparent.
4	The FV is above xyand TV is below xy.	The FV is below xy and TVis above xy.
5	The left side view is drawn on the right sideof front view.	The left side view is drawn onthe left side of front view.
6	Usually followed in India	Usually followed in USA.

11 Name the solid of revolution**?**

Ans) Solids of revolutions are solids obtained by revolving a polygon about a fixed side. Thereare 3 solids of revolutions, namely, cylinder, cone and sphere

12 What is meant by Isometric projections?Ans).

13 …What is meant by polyhedron? Give examples.

Ans). A polyhedron is a solid bounded by planes, which are called as faces. A prism hasrectangular faces and a pyramid has triangular faces. Eg. Polyhedra are prisms, pyramids.

14… Define oblique plane & auxiliary plane

Ans). Oblique planes are planes which are inclined to both HP and VP. Auxiliary planes are planes parallel to section plane or cutting plane onto which the true shape of the cut section can be seen.

15). What are the applications of development of surfaces?

Ans). The development of surfaces concept is useful in making of sheets, trays, tins, etc in packaging industry. Also the automobile body works are developed using the concepts of development of surfaces. Hence developments of surfaces find wide application in sheet metal

industry, packaging industry, automobile industry, etc.

15). When does a plane have no traces?

Ans). When a plane is parallel to a plane, it has no trace on that plane.

16. Explain oblique planes & their uses.

Ans). Oblique planes are the planes which are inclined to both HP and VP. With the help of these planes, we can find the orientation of a plane in its final position and also its approximateshape.

1. Define frustum and truncated solid.

Ans). When a pyramid or cone is cut by a section plane parallel to its base, removing the topportion, the remaining portion is called its frustum. When a solid is cut by a plane inclined to

its base, removing the top portion, the remaining portion is called as its truncated part

18). Define sectional plane, section and sectional view

Ans). Section plane: It is the cutting plane that cuts the solid at different orientations to generatea section of the solid. The section plane can be oriented w.r.t HP and VP like parallel to, perpendicular to, inclined to, etc. Section planes are referred to by their traces.

If a section plane is inclined to HP, it is referred to as the VT makes angle with xy.If a section plane is inclined to VP, it is referred to as the HT makes angle with xy.Section: It is the cut portion of the solid obtained after cutting the solid by the sectional plane.

Sectional View: It is the portion of the solid shown along with the section part in one of the views.If the section is shown along with the top view, it is called as sectional top view.

If the section is shown along with the front view, it is called sectional front view.If the section is shown along with the side view, it is called sectional side view.

19). Name few commands use in AUTOCAD

Ans). Line, Circle, Arc, Ortho, Copy, Rotate, Move , Mirror etc.

20). Name few modify commands.

Ans). Move, rotate, copy, mirror, array, erase, break, fillet, trim, scale etc.

21). What is ortho commands?

Ans). The Ortho mode in AutoCAD is used to restrict cursor movement to specific directions. It allows the cursor movement only in the vertical and horizontal direction.

22). Define isometric projections.

Ans). Isometric projection is a method for visually representing three-dimensional objects in two dimensions in technical and engineering drawings. It is an axonometric projection in which the three coordinate axes appear equally foreshortened and the angle between any two of them is 120 degrees.

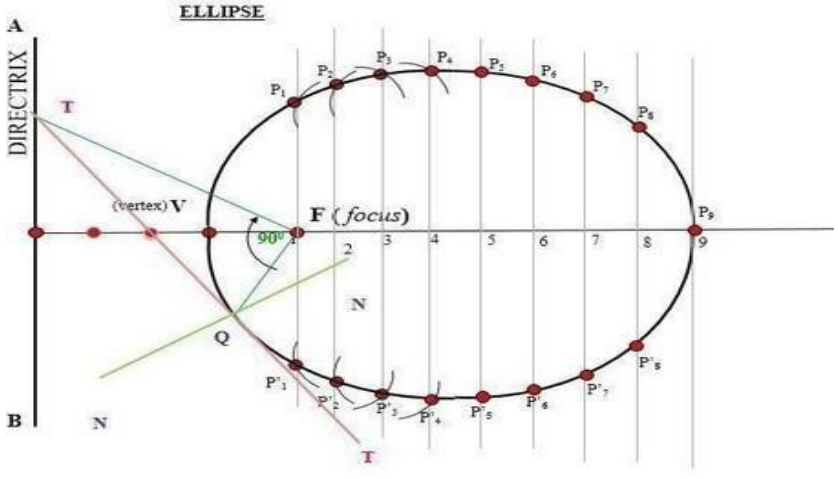
23). Name few CAD softwares.

Ans). 1. AUTOCAD
2. CRO
3. CATIA
4. SOLID WORKS
5. NX Unigraphics
6. FUSION 360
7. INVENTOR
8. SOLID EDGE

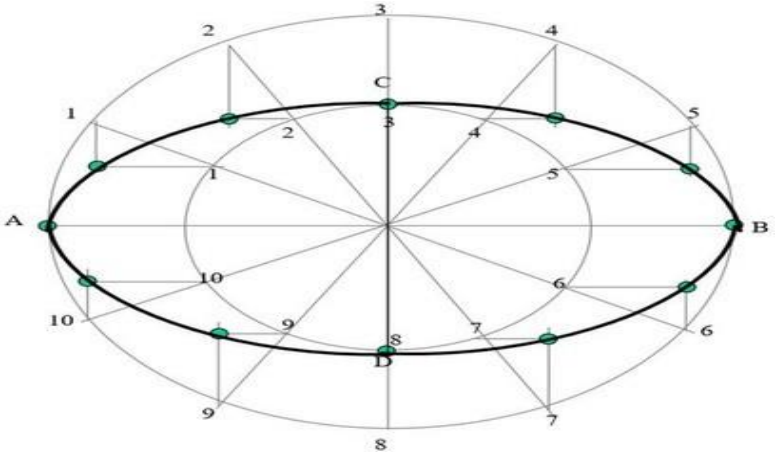
24). Write about function keys.

Ans). Function Keys
The keyboard function keys F1-F12 control settings that are commonly turned on and off as we work in the product.
Key Feature Description
F1 Help Displays Help for the active tooltip, command, Palette or dialog box.
F2 Expanded History Displays an expanded command history in the Command window
F3 Object Snap Turns object snap ON and OFF
F4 3D Object Snap Turns additional object snaps for 3D ON and OFF
F5 Isoplane Cycles through 2D isoplane settings (Top, Right and Left)
F6 Dynamic UCS Turns automatic UCS alignment with planar surfaces ON and OFF
F7 Grid display Turns the grid display ON and OFF
F8 Ortho Locks cursor movement to horizontal or vertical
F9 Grid Snap Restricts cursor movement to specified grid intervals
F10 Polar Tracking Guides cursor movement to specified angles
F11 Object Snap Tracking Tracks the cursor horizontally and vertically from object snap locations
F12 Dynamic input Displays distances and angles near the cursor and accepts input as we use Tab between fields.

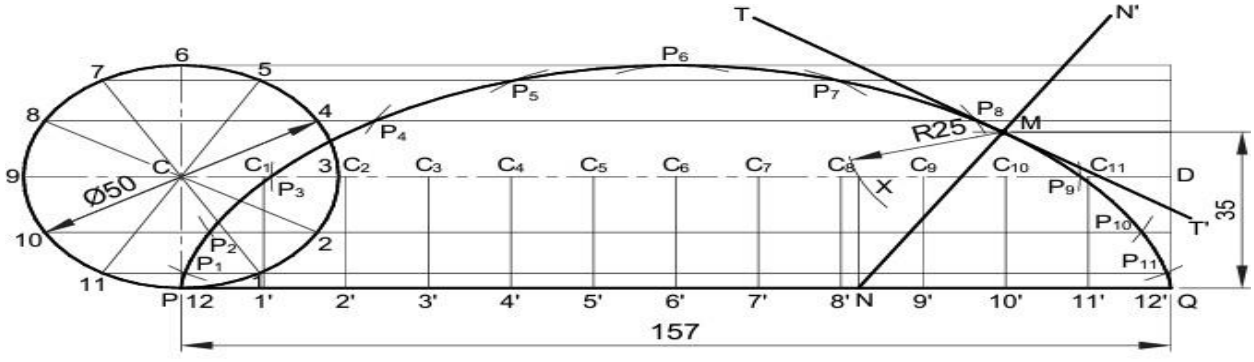
1. Construct an ellipse when the distance of the focus from the directrix is equal to 50 mm and eccentricity2/3. Also, draw a normal and a tangent to the curve at a point 35 mm from the focus



1. Major axis AB & minor axis CD are 100 and 80mm long respectively. Draw ellipse by ConcentricCircle method?

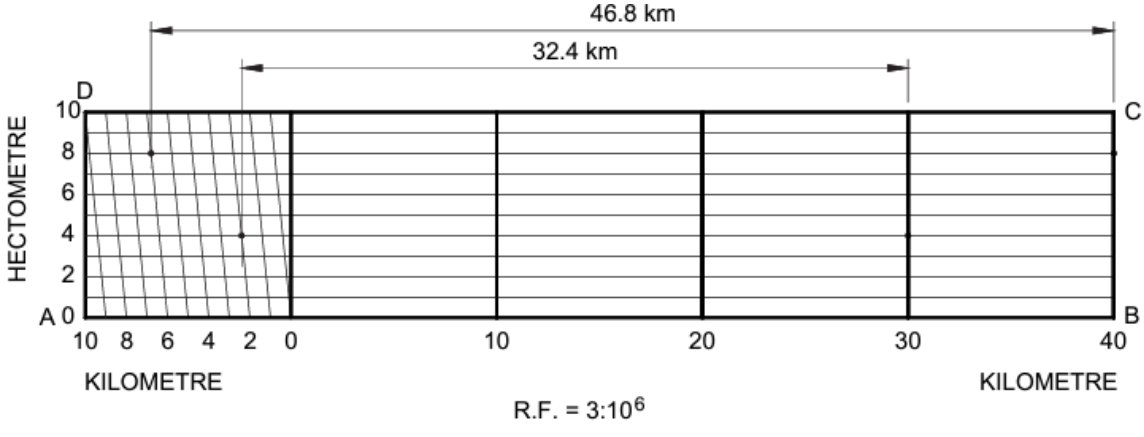


1. Construct a cycloid of a circle of diameter 50 mm when its rolls onstraight line for one revolution. Also draw tangent and normal at a distance of 35 mm away from base line on to the curve.



Cycloid

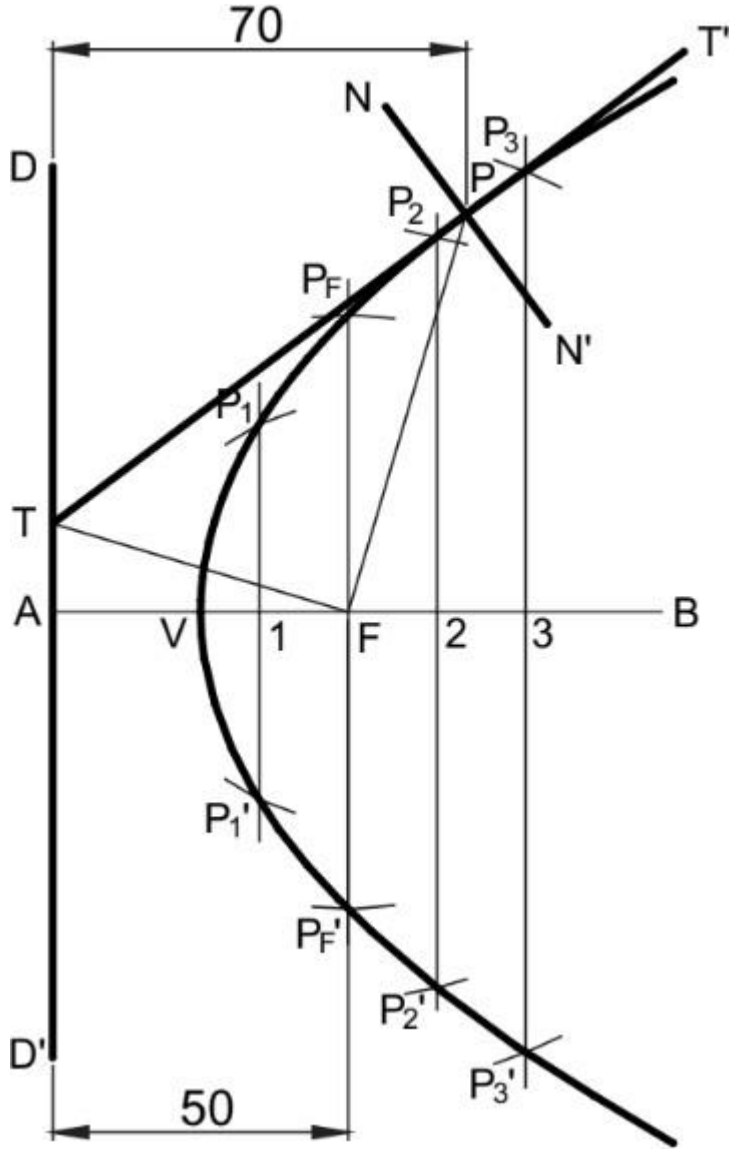
2. The distance between two stations is 100 km and on a road map it is shown by 30 cm. Draw a diagonal scale long enough to measure up to 50km and mark 46.8 km and 32.4 km on it.



Construction Refer to Fig. 4.16.

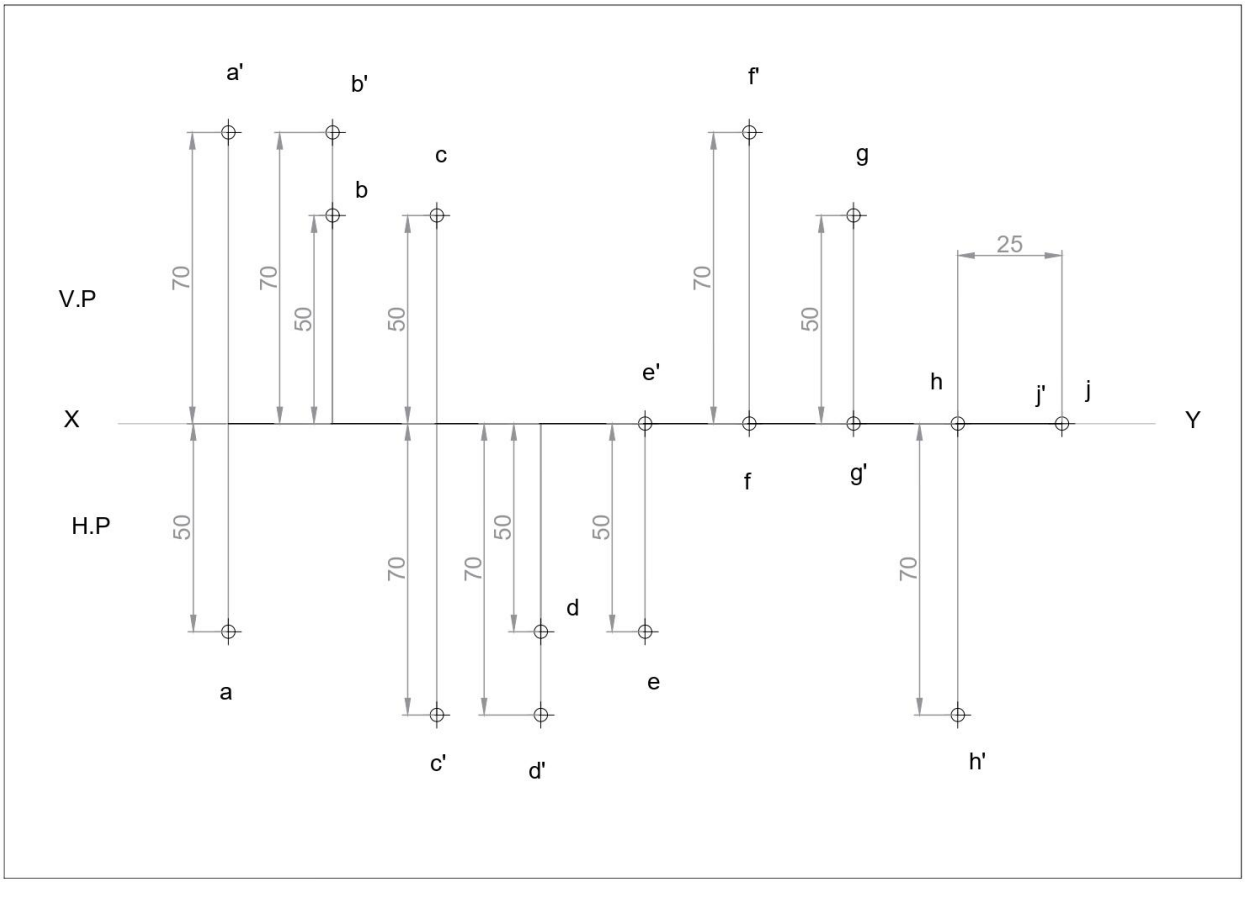
1. $\text{R.F.} = \dfrac{30\text{ cm}}{100\text{ km}} = \dfrac{30\text{ cm}}{100 \times 10^5\text{ cm}} = \dfrac{3}{10^6}$
2. Since scale has to show a distance of 46.8 km, the maximum length should be at least 50 km and the least count 0.1 km.
3. Length of scale, L_s = R.F. × Maximum length = $\dfrac{3}{10^6} \times 50 \times 10^5\text{ cm} = 15\text{ cm}$
4. Draw a rectangle *ABCD* of length 15 cm and width either 30 or 40 mm.
5. Divide *AB* into five equal parts, each representing 10 km. Erect perpendicular lines through them to meet the line *CD*.
6. Divide first division *A*0 into 10 equal subdivisions, each representing 1 km. Erect diagonal lines through them as shown.
7. Divide *AD* into 10 equal parts and draw horizontal lines through each of them to meet at *BC*.

Q2) Draw a parabola when the distance between its focus and directrix is 50 mm. Also, draw a tangent and a normal at a point 70 mm from the directrix.

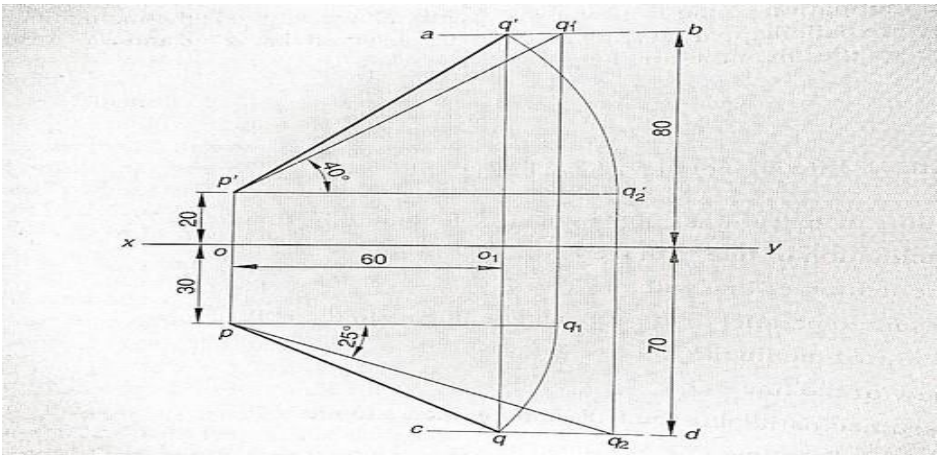


Problem-3: Draw the projection of the following points on the same ground line, keeping the projectors 25mm apart.

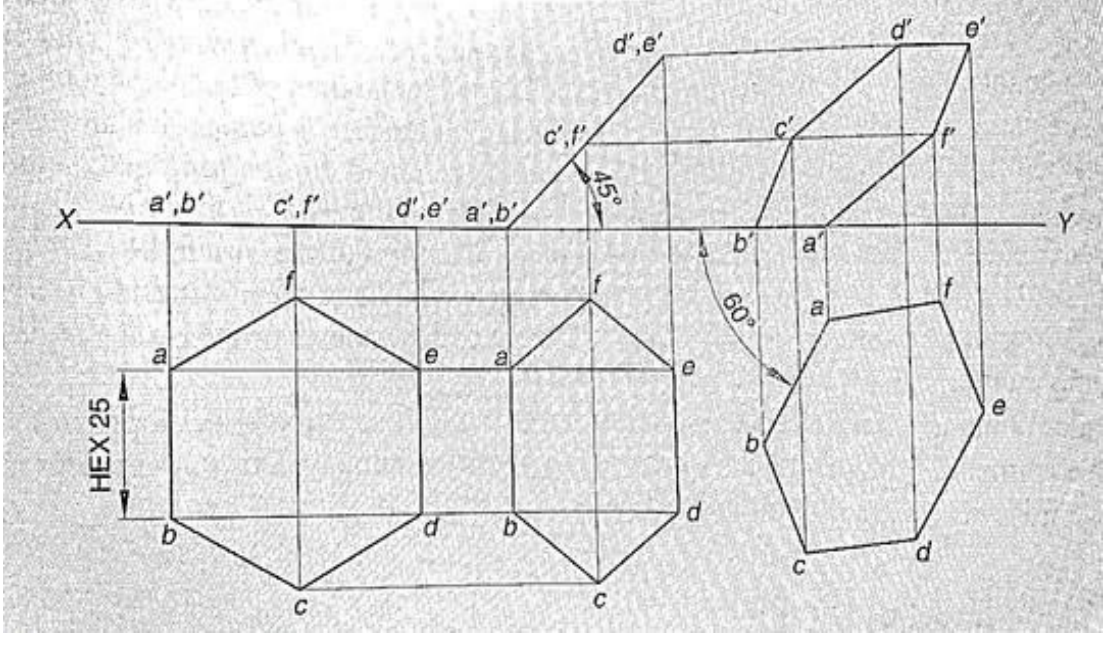
1. Point A, lying 70 mm above the H.P. and 50 mm in front of the V.P
2. Point B, lying 70 mm above the H.P. and 50 mm behind the V.P.
3. Point C, lying 70 mm below the H.P. and 50 mm behind the V.P.
4. Point D, lying 70 mm below the H.P. and 50 mm in front of the V.P.
5. Point E, lying on the H.P. and 50 mm in front of the V.P.
6. Point F, lying 70 mm above the H.P. and on the V.P.
7. Point G, lying on the H.P. and 50 mm behind the V.P.
8. Point H, lying 70 mm below the H.P. and on the V.P.
9. Point J, lying on both the H.P. and the V



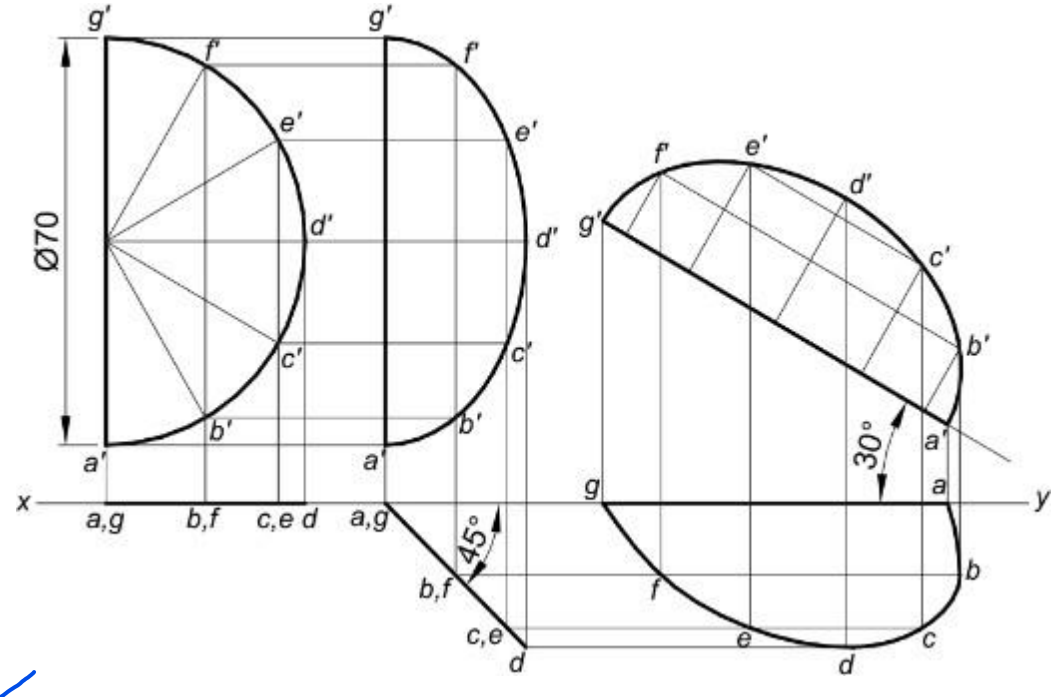
4. A straight line PQ has its end P 20 mm above the HP and 30 mm in front of the VP and the end Q is 80 mm above the HP and 70mm in front of the VP. If the end projectors are 60 mm apart draw the projections of the line. Determine its true length and True inclinations with the reference planes



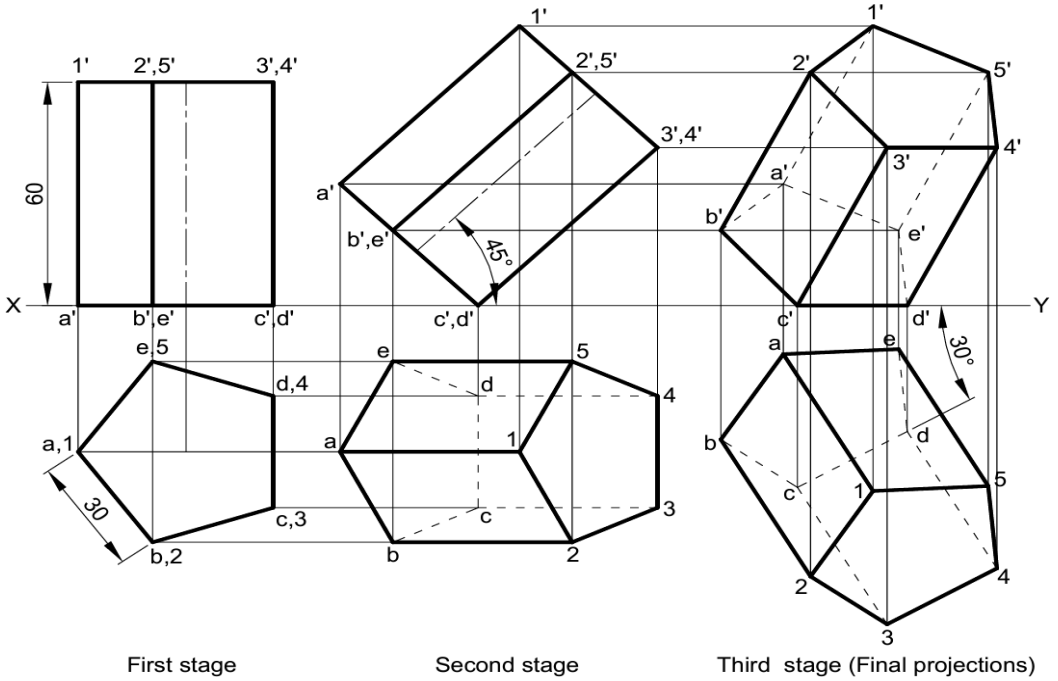
1. Draw the projections of a regular hexagon of 25mm side having one its sides in the H.Pandinclined at 60 degree to the V.P. and it's surface making an angel of 45 degree with the H.P



2. A semi-circular plane of diameter 70 mm has its straight edge on the V.P. and is inclined at 30° to the H.P. Draw the projection of the plane when its surface is inclined at 45° to8 the V.P

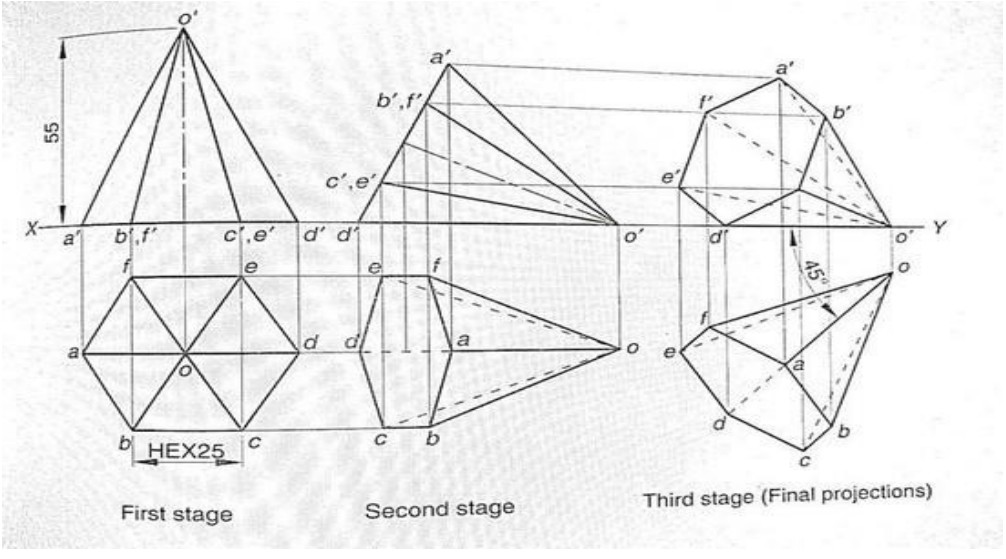


3. A pentagonal prism of base side 30 mm and height 60 mm rests on one of its base sides on the H.P. inclined at 30° to the V.P. Its axis is inclined at 45° to the H.P. Draw its projections

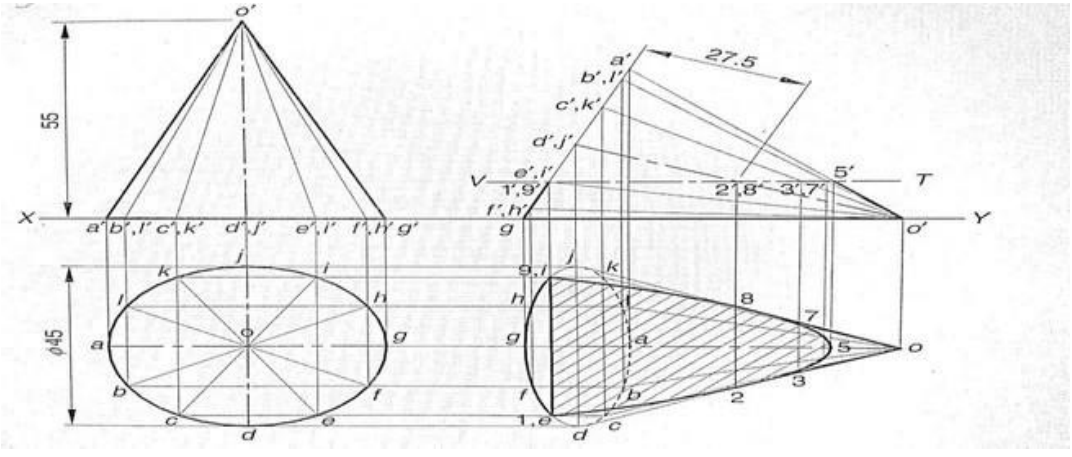


First stage Second stage Third stage (Final projections)

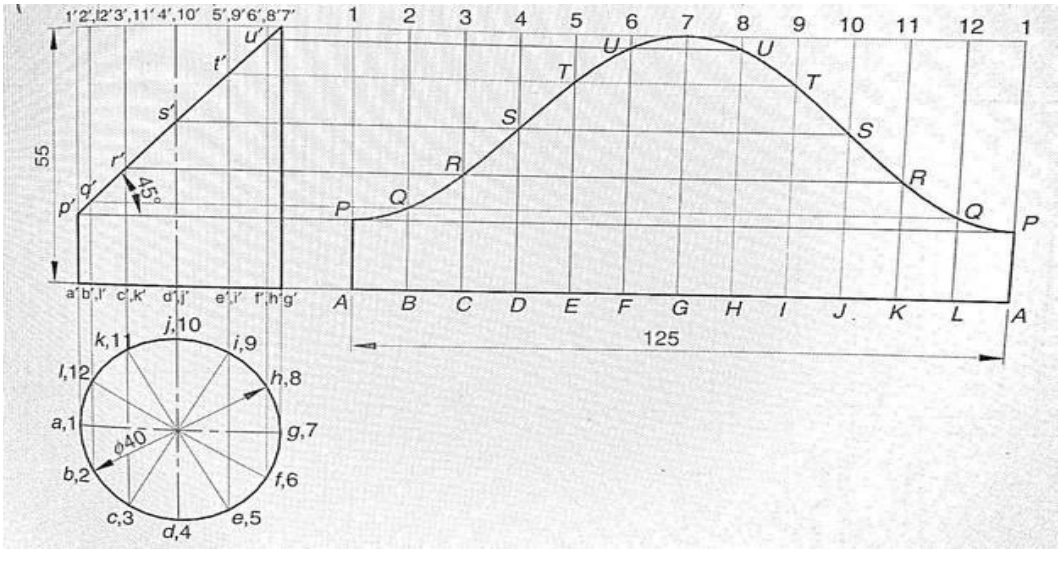
1. A hexagonal pyramid of 25mm base side and 55mm long axis, has one its slant edges on theground. A plane containing that edge and the axis is perpendicular to H.P. and inclined at 45degree to V.P. Draw it's projections, when the apex is nearer to V.P then the base.



7. A regular circular cone of the 45mm base diameter and 55 mm axis long is lying on one its generators on the H.P. It's is cut by a horizontal section plane passing through the midpoint of the axis. Draw the projections of the cone and it's true section.



. 8. A cylinder of 40mm diameter of base and 55mm long axis is resting on its base on H.P. It is cut by a section plane perpendicular to V.P. and inclined at 45 degree to H.P. The section passing through the top end of an extreme generator of the cylinder. Draw the development of the lateral surface of the cut cylinder.



1. Draw the orthographic projections from given isometric view