VEL TECH HIGH TECH

Dr. RANGARAJAN Dr. SAKUNTHALA ENGINEERING COLLEGE

An Autonomous Institution

Approved by AICTE-New Delhi, Affiliated to Anna University, Chennai

Accredited by NBA, New Delhi & Accredited by NAAC with "A" Grade & CGPA of 3.27

21ME16T

ENGINEERING GRAPHICS

COURSE MATERIALS

SEMESTER-1

R2021

UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS

ISOMETRIC PROJECTION

1. Draw the isometric view of a frustrum of a hexagonal pyramid when it is resting on its base on the HP with two sides of the base parallel to the VP. The side of base is 20 mm and top 8 mm. the height of the frustum is 55 mm.

2. Draw the isometric view of a hexagonal pyramid of base of side 15 mm and height 55 mm resting on its base on the HP with two sides of the base parallel to the VP.

3. A pentagonal pyramid of base edge 20 mm and height 60 mm rests on its base on the HP with a base edge parallel to VP and farther away from the VP. A section plane perpendicular to the VP and inclined at 45° to the HP cuts the axis of the pyramid at a point 33 mm from the vertex. Draw the isometric view of the truncated pyramid such that the cut surface is visible.

4. A cone of base diameter 50 mm and height 55 mm is resting on its base on the HP. It is cut by a plane perpendicular to the VP and inclined at 30° to the HP. The plane meets the axis at a distance of 25 mm from the apex. Draw the isometric view of the truncated cone.

5. Draw the isometric view of a frustum of a cone of height 30 mm, base diameter 34 mm, top diameter 20 mm when it is centrally placed over a square slab of side 50 mm and thickness 10 mm.

6. Draw the isometric projection of a sphere of diameter 16 mm kept centrally over a frustum of a square pyramid of height 25 mm. The frustum has a base of side 35 mm and top of side 20 mm.

7. A square pyramid of base diagonal 20 mm and height 25 mm is kept centrally over a square prism of base side 30 mm and height 25 mm resting on the ground on a square face. The base edges of the pyramid are equally inclined to the VP. One base side of the prism is parallel to the VP. Draw the isometric view of the combination of solids to full scale.

8. Draw the isometric view of a waste paper basket which is in the shape of a hexagonal pyramid of base side 200 mm and top side 350 mm. Height is 500 mm. adopt suitable scale.

PERSPECTIVE PROJECTION

9. A regular hexagonal pyramid of base edge 20 mm and height 35 mm rests on its base on the ground plane with one of its base edges touching the picture plane. The station point is 30 mm above the ground plane and 40 mm in front of the PP. The central plane is 30 mm to the right of the axis. Draw the perspective projection of the pyramid by visual ray method. Use the top view and the front view.
10. Draw the perspective view of a pentagonal prism of base side 20 mm and height 40 mm when it rests on its base on the ground plane with one of its rectangular faces parallel to and 20 mm behind the picture plane. The station point is 45 mm in front of the PP and 60 mm above the GP. The observer is 20 mm to the left of the axis. Use the top view and the side view to draw the perspective by visual ray method.
11. A cylinder of diameter 40 mm and height 40 mm rests on the GP on one of its ends with its axis 35 mm behind the picture plane. The station point is 45 mm to the right of the axis. The station point is 65 mm above the GP and 40 mm in front of the PP. draw the perspective view of the cylinder by visual ray method. Use the top and side views.
12. A square prism of base 25 x 25 mm and height 40 mm rests on the GP with the edges of the base making 45° with PP. The corner nearest to the PP is 25 mm to the right of the station point and 25 mm behind the PP. The station point is 55 mm above the GP and 70 mm in front of the PP. Draw the perspective view of the square prism.
13. A rectangular prism 40 x 30 x 15 mm rests on the ground on one of its ends with one of the longest edges touching the PP and the shortest edges receding to the left at an angle of 40° to the PP. The nearest vertical edge is 15 mm to the left of the station point which is at a distance of 55 mm in front of the PP and 30 mm above the ground. Draw the perspective view of the prism.
14. A frustum of a square pyramid of base edge 26 mm, top edge 20 mm and height 35 mm rests on its base on the ground with base edges equally inclined to the PP. the axis of the frustum is 30 mm to the right of the eye. The eye is 45 mm in front of the PP and 50 mm above the ground. The nearest base corner is 10 mm behind the PP. Draw the perspective projection of the frustum.
15. A square pyramid of base side 30 mm and altitude 40 mm rests on its base on the ground such that one of its base sides is parallel to the picture plane and 10 mm in front of it. The station point is 50 mm in front of the picture plane, 25 mm to the left of the axis of the pyramid and 55 mm above the ground. Draw the perspective view of the pyramid.

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UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS

ISOMETRICPROJECTION

1. Draw the isometric view of a frustrum of a hexagonal pyramid when it is resting on itsbaseontheHPwithtwosidesofthebaseparalleltotheVP.Thesideofbaseis20mmandtop 8 mm. theheightof thefrustum is55 mm.

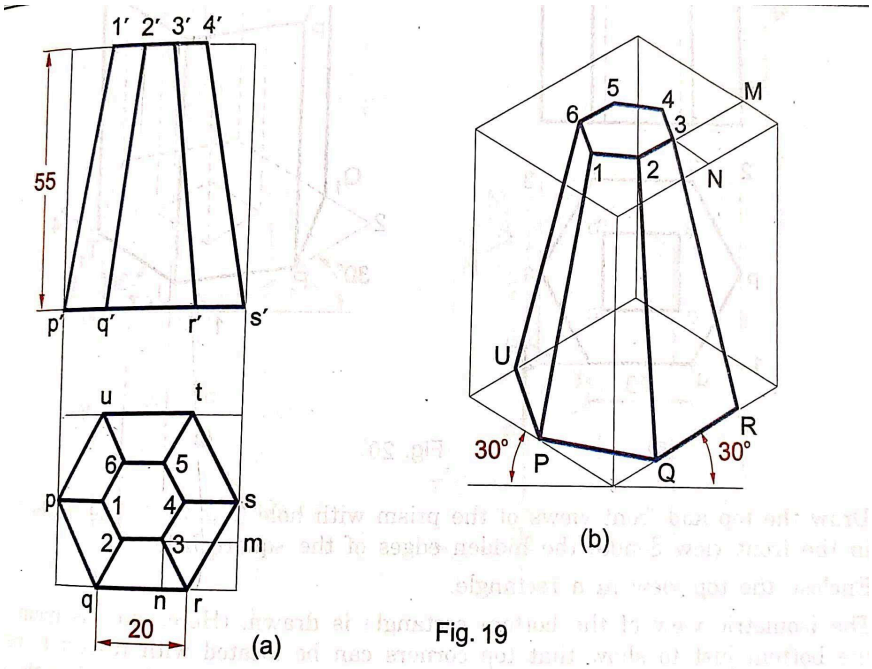


Fig. 19

2. Draw the isometric view of a hexagonal pyramid of base of side 15 mm and height 55mmrestingonitsbaseontheHPwithtwosidesofthebaseparalleltotheVP.

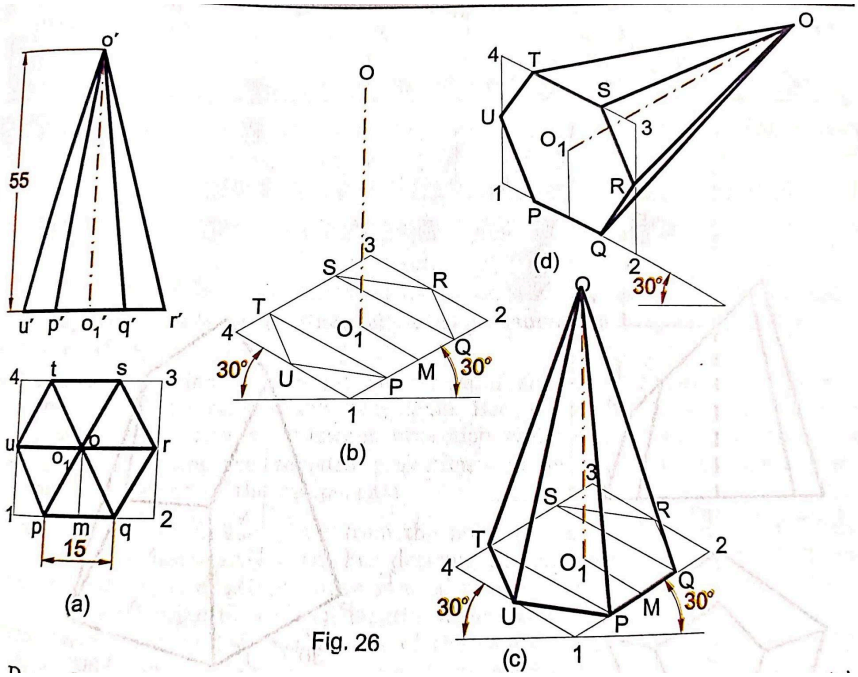


Fig. 26

3. A pentagonal pyramid of base edge 20 mm and height 60 mm rests on its base on the HPwith a base edge parallel to VP and farther away from the VP. A section planeperpendicular to the VP and inclined at 45° to the HP cuts the axis of the pyramid at apoint33mmfrom thevertex.Drawtheisometric viewof thetruncatedpyramidsuch thatthecut surfaceisvisible.

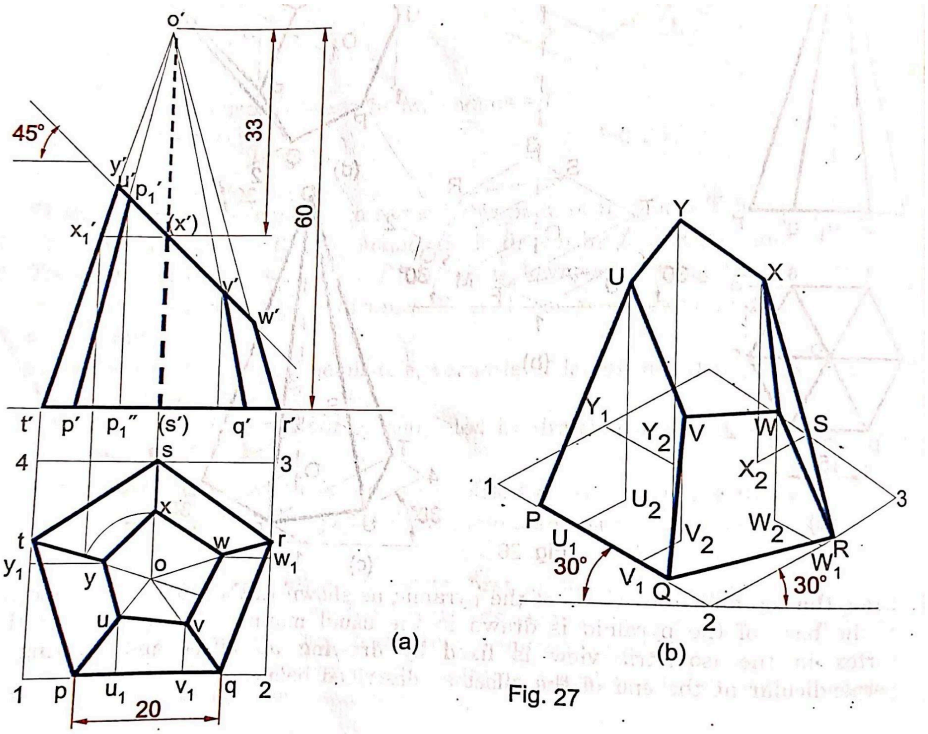
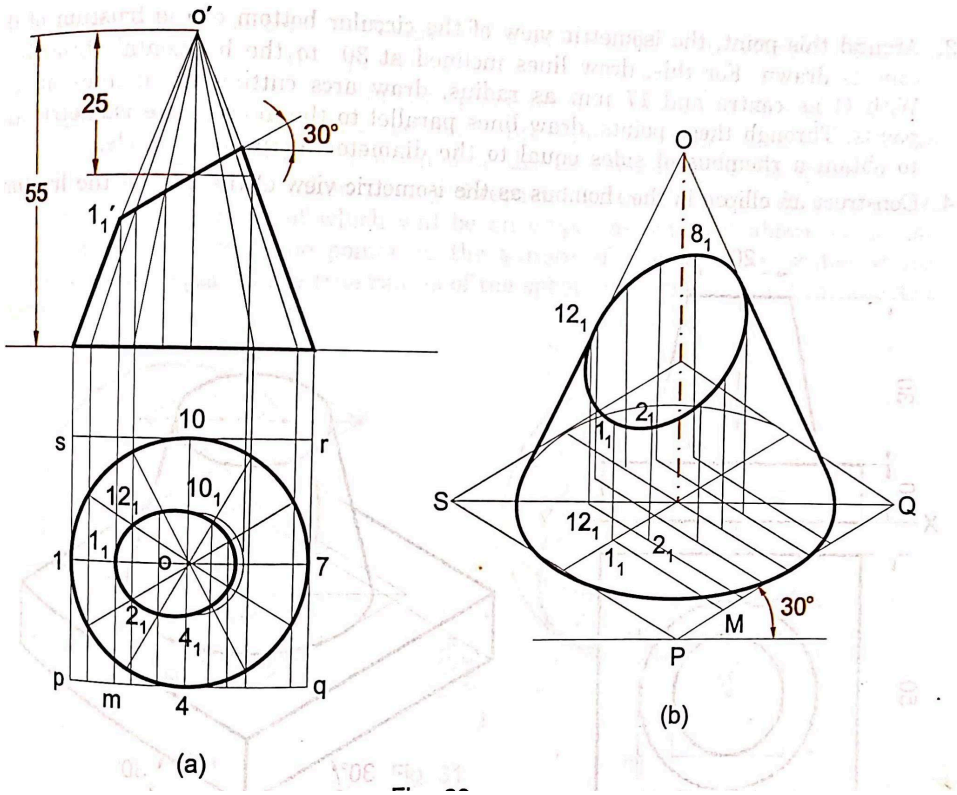


Fig. 27

4. A cone of base diameter 50 mm and height 55 mm is resting on its base on the HP. It iscutbyaplaneperpendiculartoVPand inclined at30° to the HP.The planemeetstheaxis at a distance of 25 mm from the apex. Draw the isometric view of the truncatedcone.



5. Drawtheisometric view ofafrustumofaconeof height 30 mm,basediameter34mm,top diameter 20 mm when it is centrally placed over a square slab of side 50 mm andthickness10 mm.

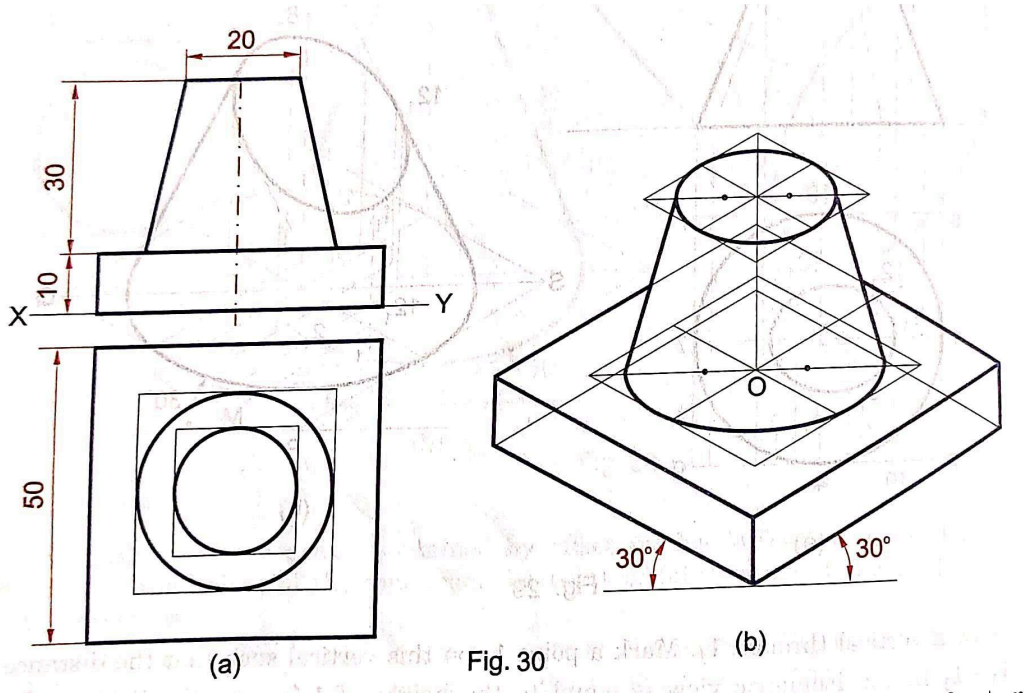


Fig. 30

6. Draw the isometric projection of a sphere of diameter 16 mm kept centrally over afrustum of a square pyramid of height 25 mm. The frustum has a base of side 35 mm andtop of side 20 mm.

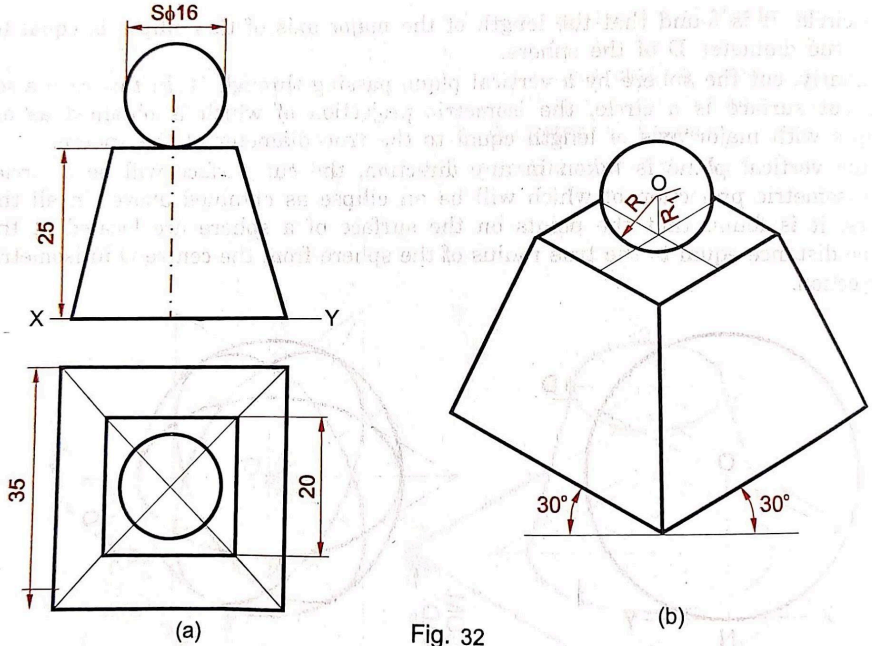


Fig. 32

7. A square pyramid of base diagonal 20 mm and height 25 mm is kept centrally over asquareprismof baseside30mmand height25 mmrestingonthe groundonasquare

face.Thebaseedges of thepyramid areequallyinclined totheVP. Onebasesideoftheprism is parallel to the VP. Draw the isometric view of the combination of solids to fullscale.

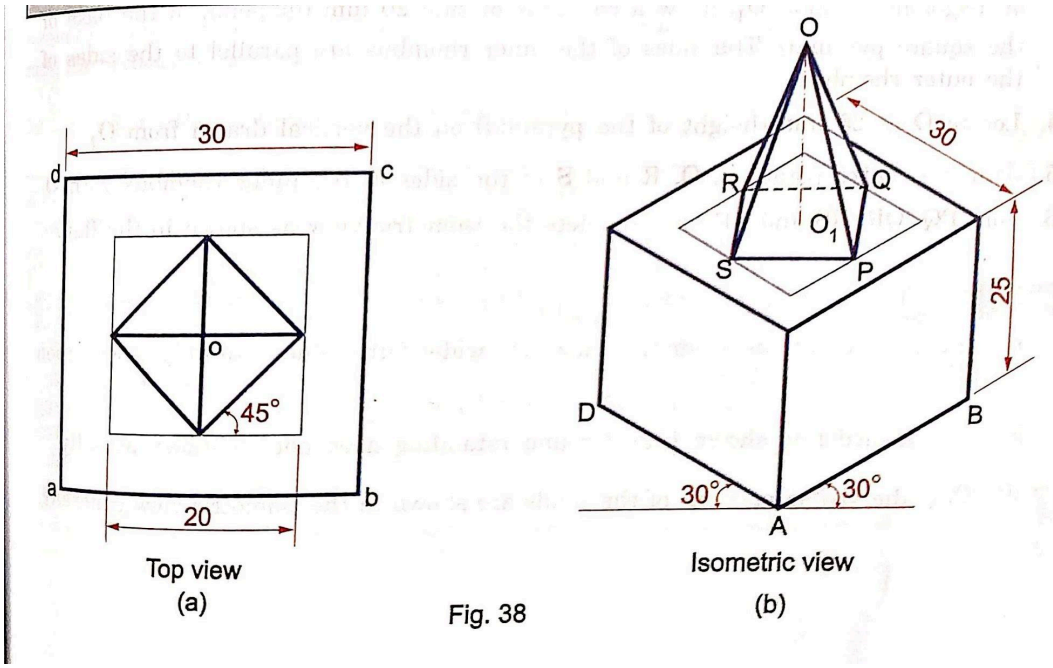
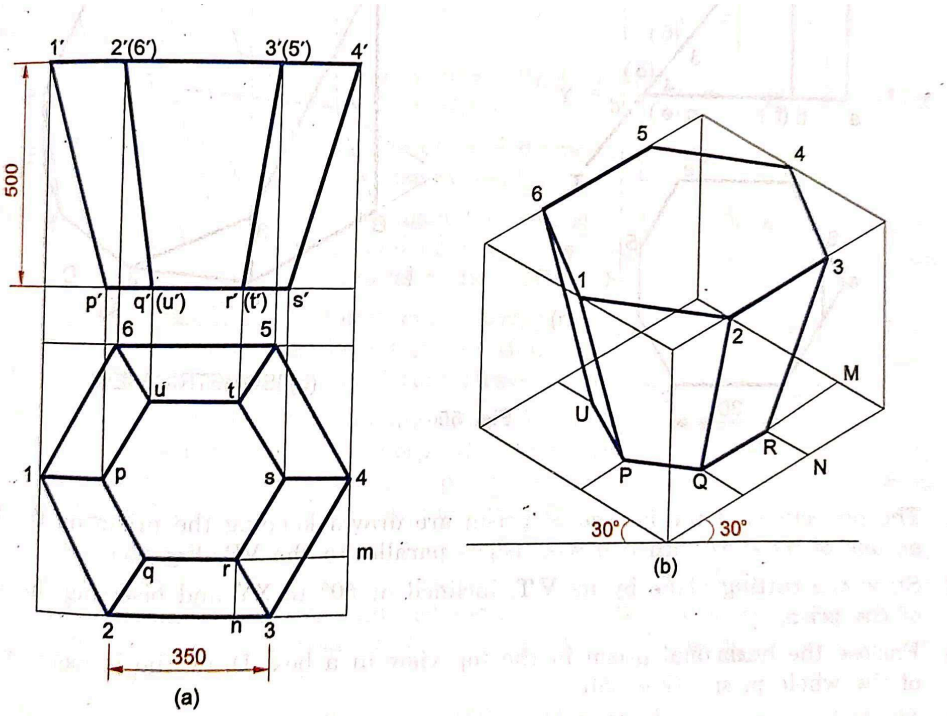


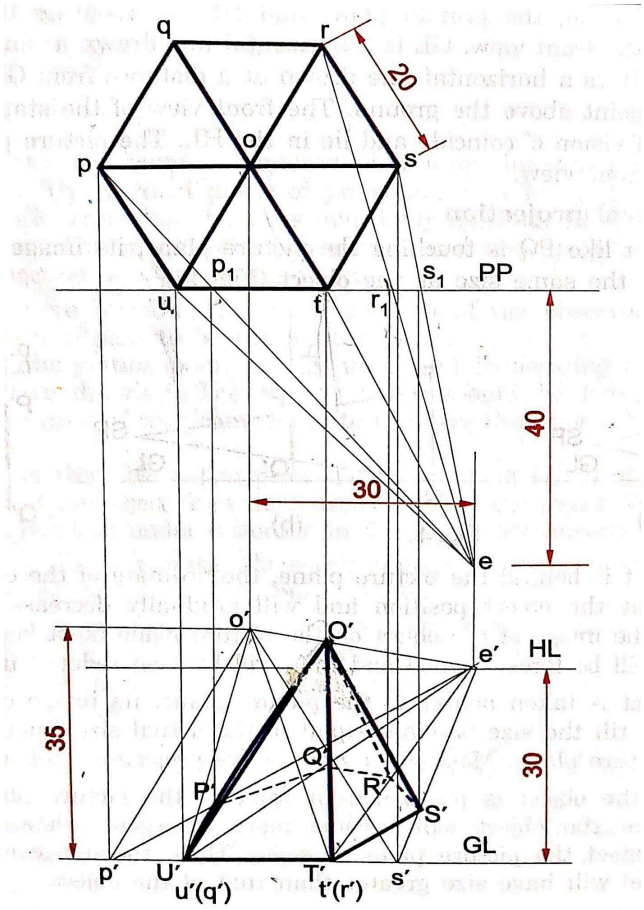
Fig. 38

8. Draw the isometric view of a waste paper basket which is in the shape of a hexagonalpyramid of base side 200 mm and top side 350 mm. Height is 500 mm. adopt suitablescale.



PERSPECTIVEPROJECTION

9. A regular hexagonal pyramid of base edge 20 mm and height 35 mm rests on its base onthe ground plane with one of its base edges touching the picture plane. The station pointis 30 mm above the ground plane and 40 mm in front of the PP. The central plane is 30mm to the right of the axis. Draw the perspective projection of the pyramid by visual raymethod.Usethe top view and the front view.



10. Draw the perspective view of a pentagonal prism of base side 20 mm and height 40 mmwhen it rests on its base on the ground plane with one of its rectangular faces parallel toand 20 mm behind the picture plane. The station point is 45 mm in front of the PP and 60mmabovethe GP. Theobserver is20 mm to theleft oftheaxis. Use thetop viewand theside viewto draw theperspectivebyvisual raymethod.

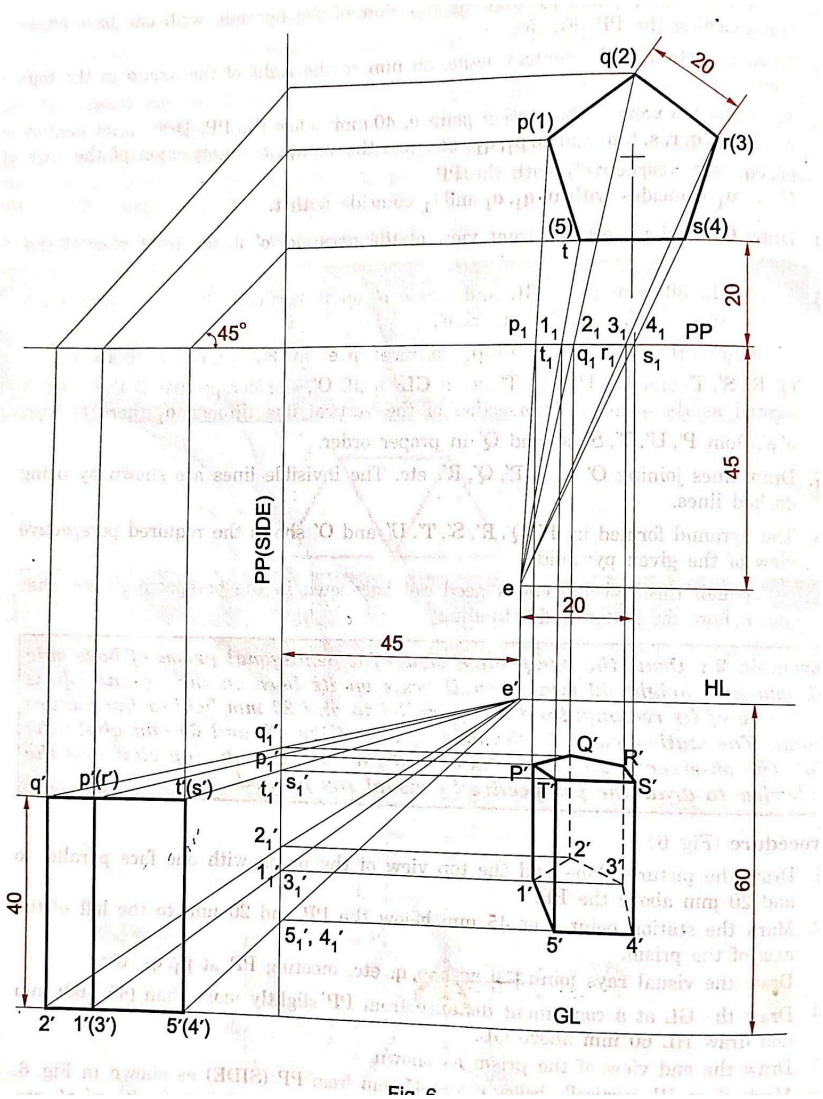


Fig. 6

11. A cylinder of diameter 40 mm and height 40 mm rests on the GP on one of its ends withits axis 35 mm behind the picture plane. The station point is 45 mm to the right of theaxis. The station point is 65 mm above the GP and 40 mm in front of the PP. draw theperspectiveview ofthecylinderbyvisual raymethod. Usethetop and sideviews.

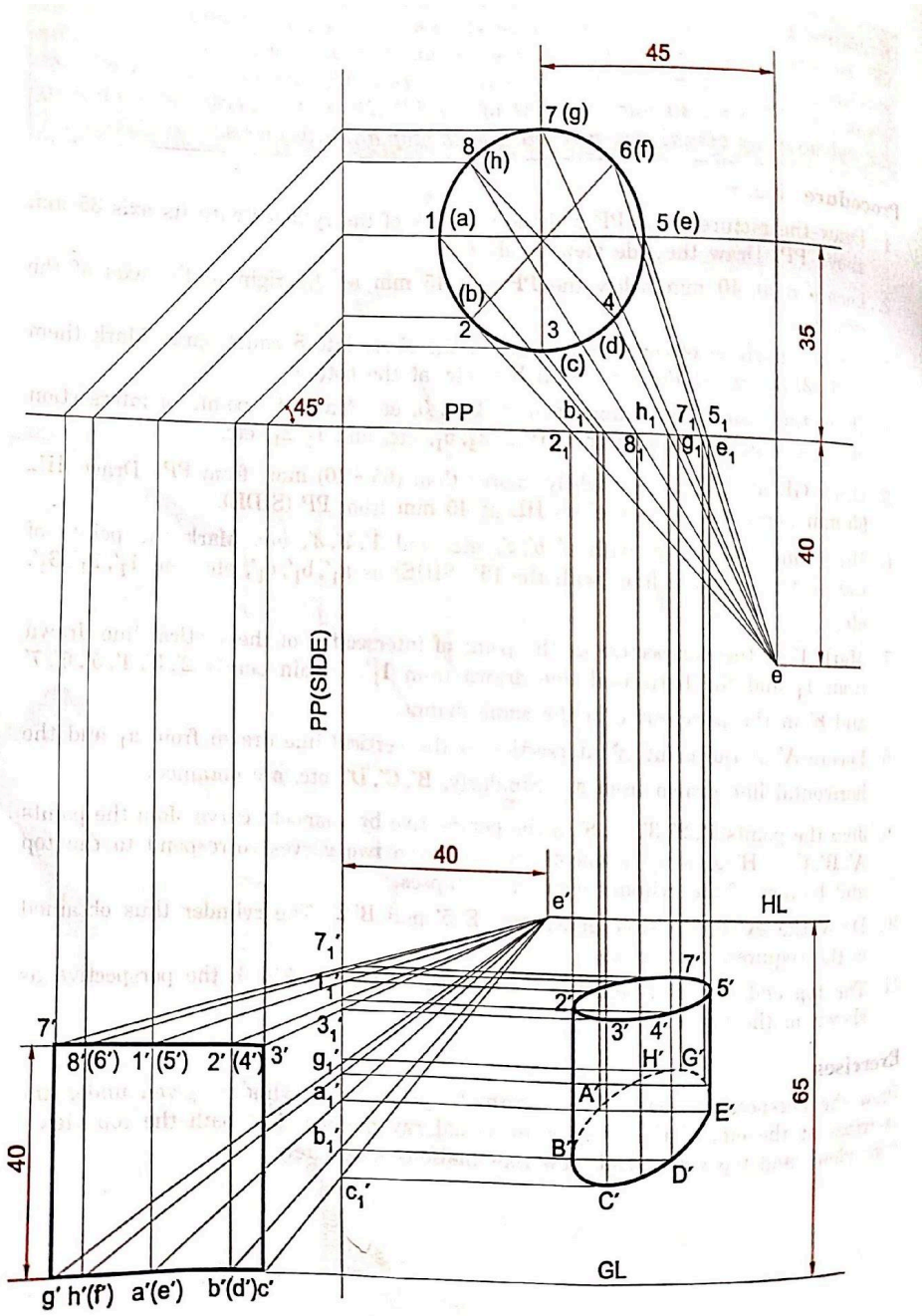


Fig. 8

12. A square prism of base 25 x 25 mm and height 40 mm rests on the GP with the edges ofthe base making 45° with PP. The corner nearest to the PP is 25 mm to the right of thestation point and 25 mm behind the PP. The station point is 55 mm above the GP and 70mmin front of thePP.Draw theperspectiveviewofthe square prism.

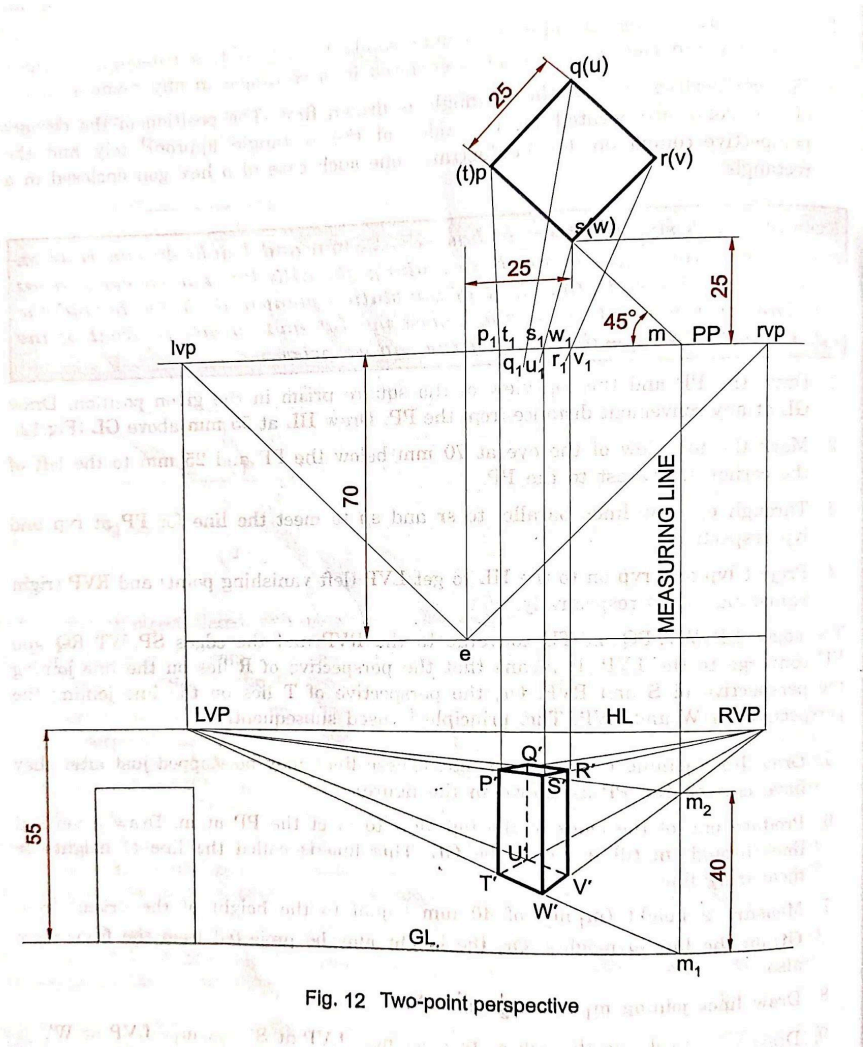
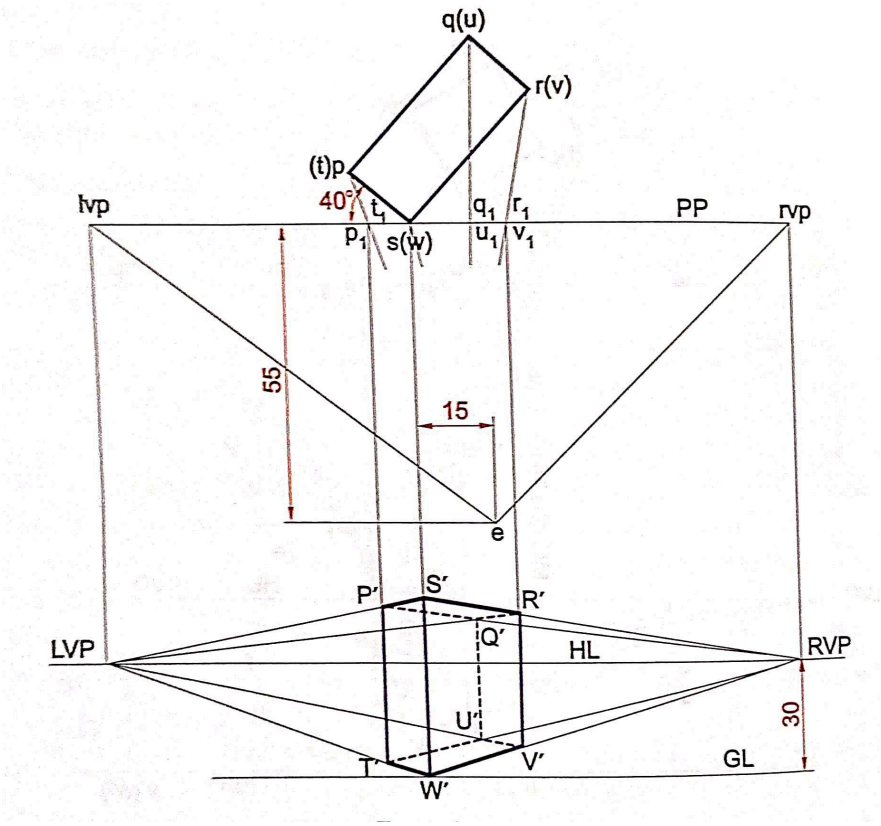


Fig. 12 Two-point perspective

13. A rectangular prism 40 x 30 x 15 mm rests on the ground on one of its ends with one ofthe longest edges touching the PP and the shortest edges receding to the left at an angle of40° tothePP.Thenearest verticaledgeis15mm totheleftofthestationpoint whichisat a distance of 55 mm in front of the PP and 30 mm above the ground. Draw theperspectiveview ofthe prism.



14. A frustum of a square pyramid of base edge 26 mm, top edge 20 mm and height 35 mmrests on its base on the ground with base edges equally inclined to the PP. the axis of thefrustum is 30 mm to the right of the eye. The eye is 45 mm in front of the PP and 50 mmabovethe ground.Thenearestbase corneris 10mmbehindthePP.Drawtheperspectiveprojectionofthe frustum.

Example 9 : *A frustum of a square pyramid of base edge 26 mm, top edge 20 mm and height 35 mm rests on its base on the ground with base edges equally inclined to the PP. The axis of the frustum is 30 mm to the right of the eye. The eye is 45 mm in front of the PP and 50 mm above the ground. The nearest base corner is 10 mm behind the PP. Draw the perspective projection of the frustum.*

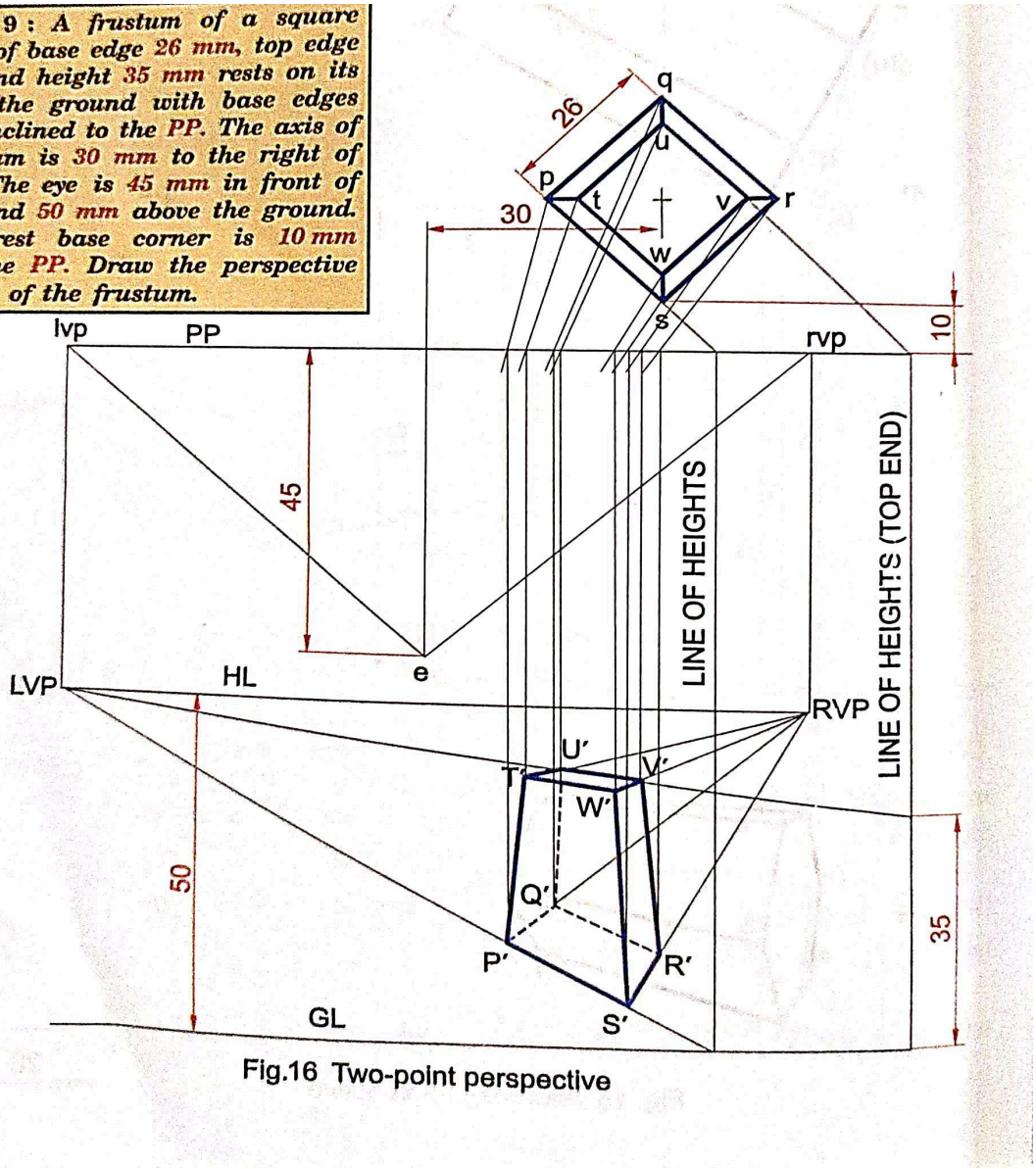
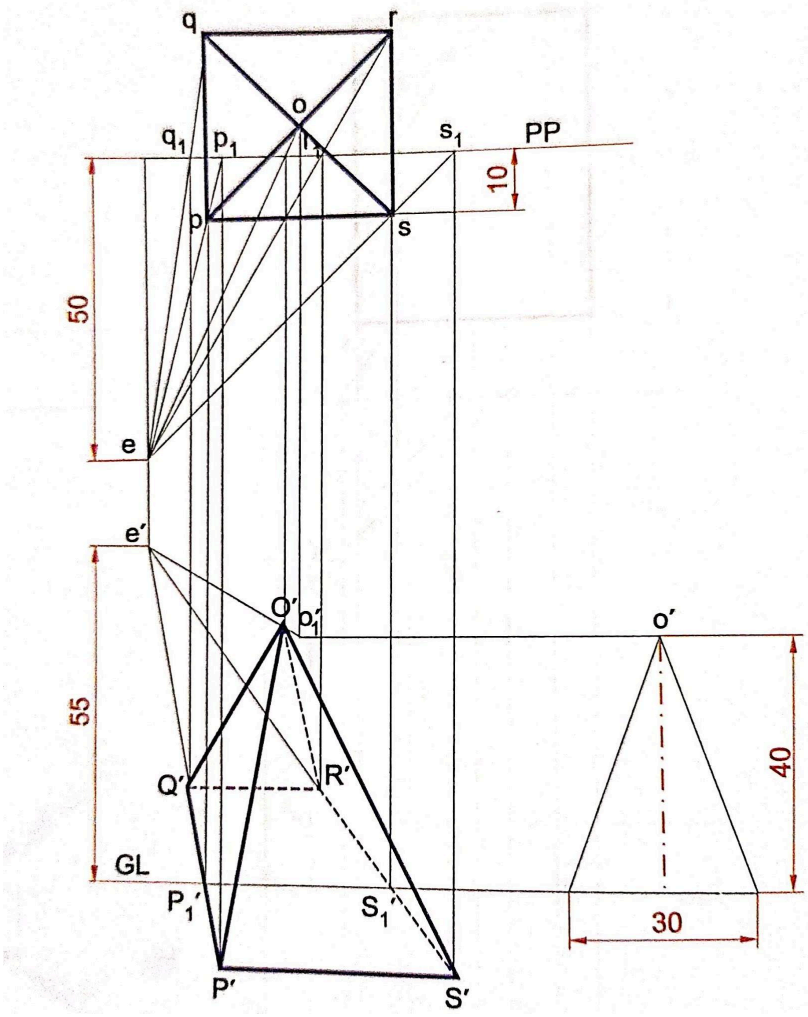


Fig.16 Two-point perspective

15. A square pyramid of base side 30 mm and altitude 40 mm rests on its base on the groundsuch that one of its base sides is parallel to the picture plane and 10 mm in front of it. Thestation point is 50 mm in front of the picture plane, 25 mm to the left of the axis of thepyramidand55 mmabovethe ground.Draw the perspectiveviewofthe pyramid.


q
r
o
q_1
p_1
l_1
s_1
PP
10
p
s
50
e
e′
O′
o_1'
o′
55
40
Q′
R′
GL
P_1'
S_1'
30
P′
S′

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