PVP 23

Code: 23ES1104

I B.Tech - I Semester – Regular / Supplementary Examinations
DECEMBER 2025

ENGINEERING GRAPHICS

(Common for ME, IT)

Duration: 3 hours Max. Marks: 70

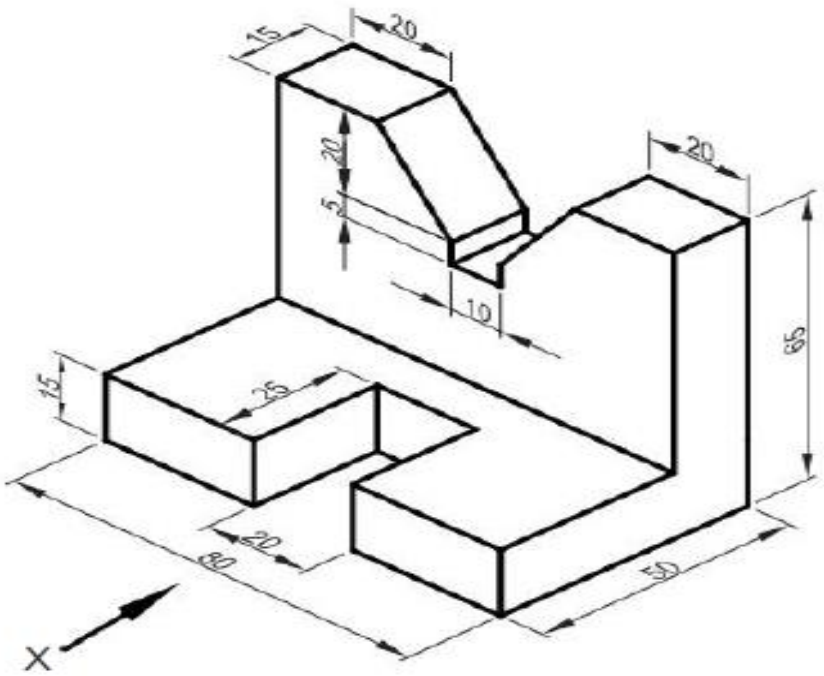
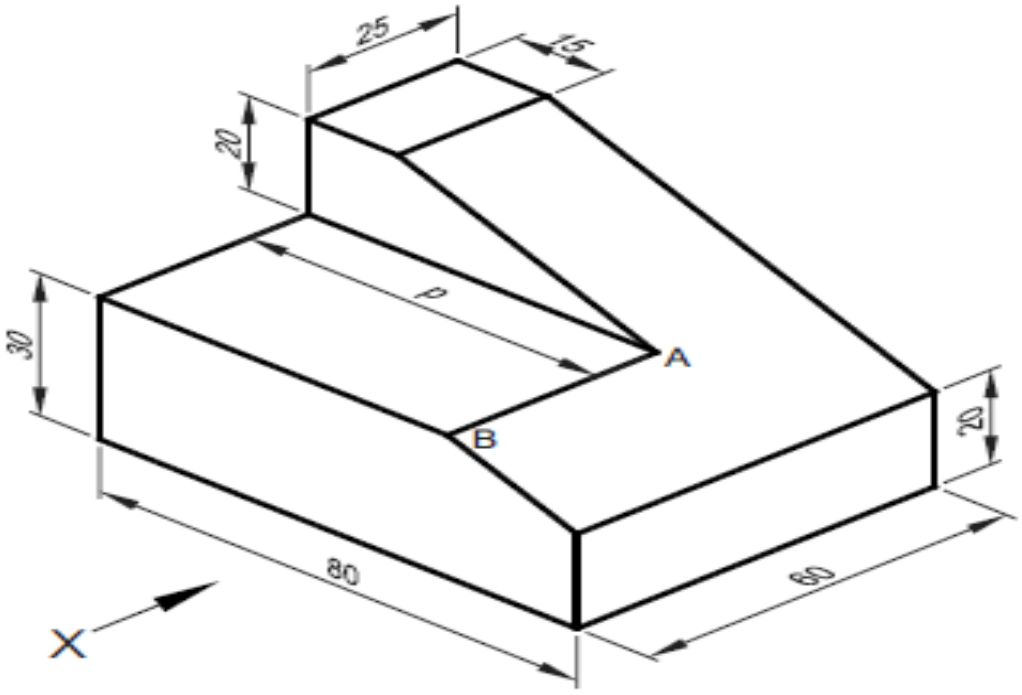
Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

BL – Blooms Level CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1		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.	L3	CO1	14 M
OR					
2	a)	The distance between two points on a map is 15 cm. The real distance between them is 20 km. Draw a diagonal scale to measure up to 25 km and show a distance of 18.6 km on it.	L2	CO1	9 M
	b)	A real length of 1 decametre is represented by a line of 5 cm in a drawing. Find the R.F. and construct a plain scale to measure up to 2.5 decametres. Mark a distance of 19 m on it.	L1	CO1	5 M

UNIT-II					
3		A 70 mm long line PQ has its end P 20 mm above the H.P. and 40 mm in front of the V.P. The other end Q is 60 mm above the H.P. and 10 mm in front of the V.P. Draw the projections of PQ and determine its inclinations with the reference planes.	L3	CO2	14 M
OR					
4	a)	Draw the projections of the following points on a common reference line keeping the distance between their projectors 30 mm apart. i. Point P is 35 mm below the H.P. and in the V.P. ii. Point Q is 40 mm in front of the V.P. and 25 mm below the H.P. iii. Point R is 45 mm above the H.P. and 20 mm behind the V.P. iv. Point S is 30 mm below the H.P. and 45 mm behind the V.P. v. Point T is both in H.P. and V.P.	L2	CO2	9 M
	b)	Draw the projections of a point D, lying 70 mm below the H.P. and 50 mm in front of the V.P., and another point C, lying 70 mm below the H.P. and 50 mm behind the V.P.	L1	CO2	5 M
UNIT-III					
5		A hexagonal plane of side 30 mm has a corner on the ground. Its surface is inclined at 45° to the	L3	CO2	14 M

	H.P. and the top view of the diagonal through the corner which is in the H.P. makes an angle of 60° with the V.P. Draw its projections.			
	OR			
6	A cone of base diameter 50 mm and axis 60 mm has a generator in the V.P. and the axis parallel to the H.P. Draw its projections.	L3	CO2	14 M
	UNIT-IV			
7	A triangular prism of base side 50 mm and axis 50 mm lies on one of its rectangular faces on the H.P. with its axis inclined at 30° to the V.P. It is cut by a horizontal section plane at a distance of 5 mm from the axis. Draw its front view and sectional top view.	L3	CO2	14 M
	OR			
8	A cylinder of base diameter 50 mm and axis 70 mm is resting on the ground with its axis vertical. It is cut by a section plane perpendicular to the V.P., inclined at 45° to the H.P., passing through the top of a generator and cuts all the other generators. Draw the development of its lateral surface.	L3	CO3	14 M
	UNIT-V			
9	Pictorial view of an object is shown in Fig. below. Using first-angle projection, draw its (a) front view, (b) top view, and (c) right-hand side view.	L3	CO4	14 M

				
	OR			
10	Pictorial view of an object is shown in Fig.below. Using first-angle projection, draw its (a) front view, (b) top view, and (c) side view.	L3	CO4	14 M
				

Scheme of Valuation for question paper

Code: **23ES1104**

PVP 23

I B.Tech. I Semester –Regular / Supplementary Examinations

~~April-2022~~ December - 2025.

ENGINEERING GRAPHICS

(Common for ME, IT)

Note:

All dimensions are in mm

The solutions are drawn NOT TO SCALE

Due credit may be given for correct usage of pencils and neatness of the drawing

Labelling is arbitrary

Check for different feasibilities of solutions as some of them can be drawn in different approaches

UNIT-I

1. Marking focus and Vertex – 2M
   Drawing VE and CE lines – 2M
   Drawing perpendicular lines to axis and marking 1-1', 2-2'.... – 2M
   Marking arc intersection points P1, P2... – 2M
   Construction of Parabola – 2M
   Tangent and normal – 2M
   Dimensioning – 2M

OR

2. **(A)** Calculation of RF – 2M
   Calculation of LOS – 1M
   Draw the main scale and split into 5 parts – 1M
   First subdivision – 1M
   Second sub division (diagonal scale) – 2M
   Marking 18.6 Km – 1M
   Representation of units – 1M

   (B) Calculation of RF – 1M
   Calculation of LOS – 1M
   Draw the main scale and split into 5 parts – 1M
   subdivision – 1M
   Marking 19m – 1M

UNIT-II

3. Projection of point P – 2M
   Projection of point Q (locus lines) – 2M
   Drawing true lengths (pq_2 and $p'q_1'$) – 2M
   Drawing FV ($p'q_2'$) length and TV (pq_1) length – 2M
   Drawing final FV and TV – 2M
   Determining angles – 2M
   Dimensionong – 2M

OR

4. **(A)** Projections of P – 1M
   Projections of Q – 2M
   Projections of R – 2M
   Projections of S – 2M
   Projections of T – 1M
   Dimensioning – 1M

   (B) Projections of D – 2M
   Projections of C – 2M
   Dimensioning – 1M

UNIT-III

5. Drawing initial positions – 4M
   Drawing first stage (surface inclination) Projections – 4M
   Drawing Second stage (diagonal Inclination) Projections – 4M
   Dimensioning – 2M

OR

6. Drawing initial positions – 4M
   Drawing the T.V. of cone with generator on VP – 4M
   Drawing the F.V. of cone – 4M
   Dimensioning – 2M

UNIT-IV

7. Drawing initial positions – 2M
   Drawing the prism in inclined position – 3M
   Drawing cutting plane – 2M
   Projecting the section plane intersection points to FV – 3M
   Hatching – 2M
   Dimensioning – 2M

OR

8. Drawing initial positions – 2M
   Drawing cutting plane – 2M
   Development – 8M
   Dimensioning – 2M

UNIT-V

9. Front View – 5M
   Top view – 5M
   Side view – 3M
   Dimensioning – 1M

OR

10. Front View – 5M
    Top view – 5M
    Side view – 3M
    Dimensioning – 1M

Scheme of Valuation for question paper

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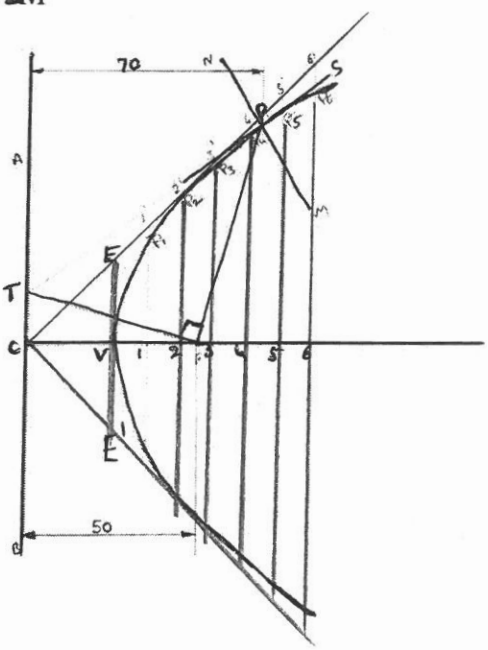
Note:
All dimensions are in mm
The solutions are drawn NOT TO SCALE
Due credit may be given for correct usage of pencils and neatness of the drawing
Labelling is arbitrary
Check for different feasibilities of solutions as some of them can be drawn in different approaches

UNIT-I

1. 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. **14 M**

Solution)

Marking focus and Vertex – 2M
Drawing VE and CE lines – 2M
Drawing perpendicular lines to axis and marking 1-1', 2-2'.... 2M
Marking arc intersection points P1, P2... 2M
Construction of Parabola – 2M
Tangent and normal – 2M
Dimensioning – 2M



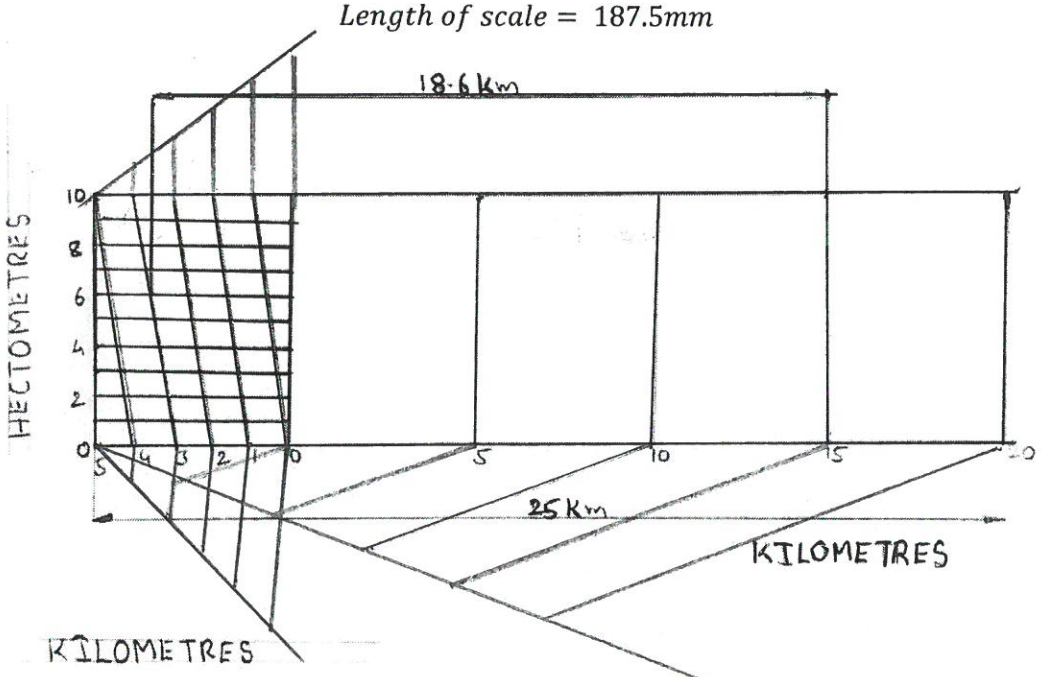
OR

2. A) The distance between two points on a map is 15 cm. The real distance between them is 20 km. Draw a diagonal scale to measure up to 25 km and show a distance of 18.6 km on it. **9 M**

Solution)
Calculation of RF – 2M
Calculation of LOS – 1M
Draw the main scale and split into 5 parts – 1M
First subdivision – 1M
Second sub division (diagonal scale) – 2M
Marking 18.6 Km – 1M
Representation of units – 1M

$$RF = \frac{3}{400000}$$

$$Length\ of\ scale = 187.5mm$$

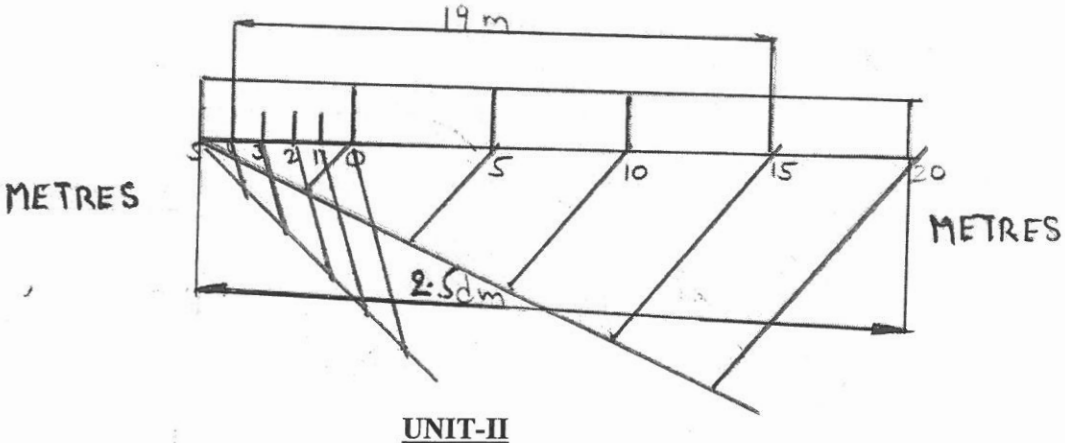


B) A real length of 1 decametre is represented by a line of 5 cm in a drawing. Find the R.F. and construct a plain scale to measure up to 2.5 decametres. Mark a distance of 19 m on it. **5M**

$$RF = \frac{1}{200}$$

$$Length\ of\ scale = 125mm$$

Solution)
Calculation of RF – 1M
Calculation of LOS – 1M
Draw the main scale and split into 5 parts – 1M
subdivision – 1M
Marking 19m – 1M



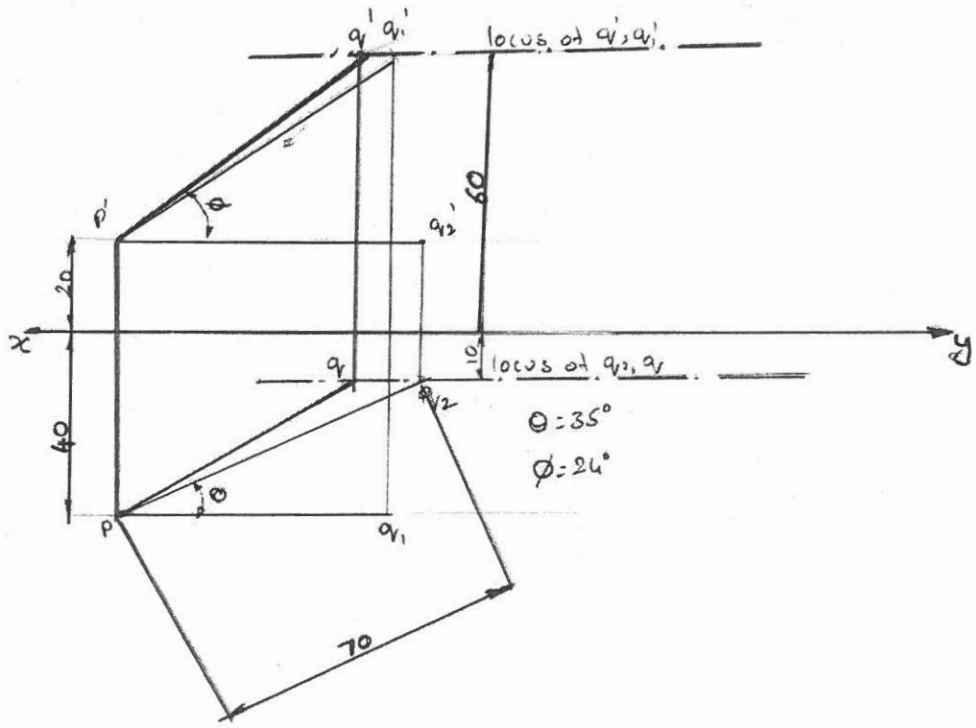
UNIT-II

3. A 70 mm long line PQ has its end P 20mm above the H.P. and 40mm in front of the V.P. The other end Q is 60mm above the H.P. and 10 mm in front of the V.P. Draw the projections of PQ and determine its inclinations with the reference planes.

5 M

Solution)

Projection of point P – 2M
Projection of point Q (locus lines) – 2M
Drawing true lengths (pq_2 and $p'q_1'$) – 2M
Drawing FV ($p'q_2'$) length and TV (pq_1) length – 2M
Drawing final FV and TV – 2M
Determining angles – 2M
Dimensionong – 2M

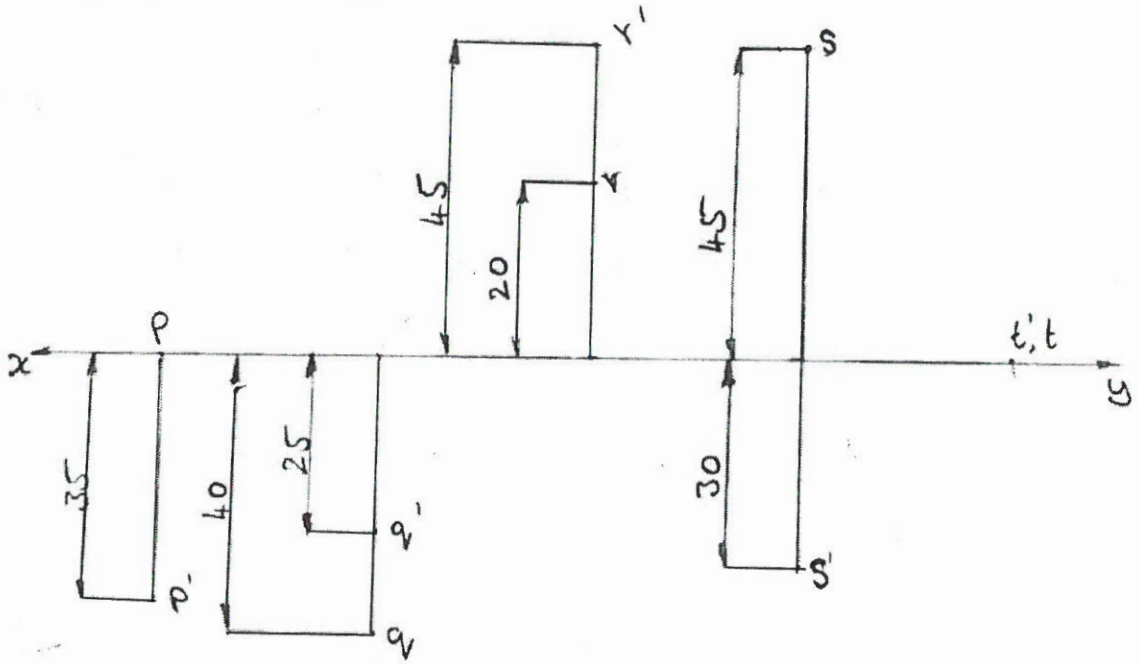


OR

4. (a) Draw the projections of the following points on a common reference line keeping the distance between their projectors 30mm apart.
i. Point P is 35mm below the H.P. and in the V.P.
ii. Point Q is 40mm in front of the V.P. and 25mm below the H.P.
iii. Point R is 45mm above the H.P. and 20mm behind the V.P.
iv. Point S is 30mm below the H.P. and 45 mm behind the V.P.
V. Point T is both in H.P. and V.P. **9 M**

Solution)

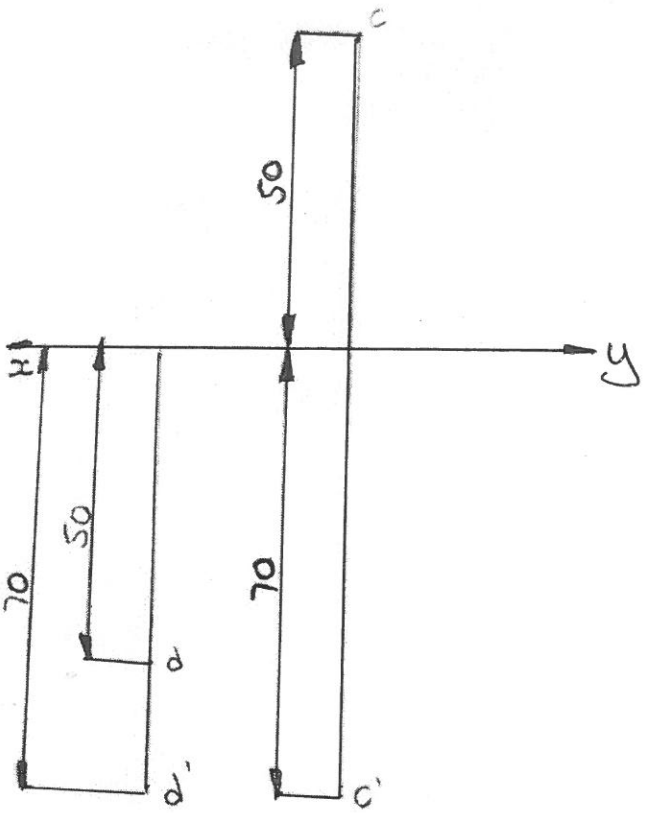
Projections of P	– 1M
Projections of Q	– 2M
Projections of R	– 2M
Projections of S	– 2M
Projections of T	– 1M
Dimensioning	– 1M



(b) Draw the projections of a point D, lying 70mm below the H.P. and 50mm in front of the V.P., and another point C, lying 70 mm below the H.P. and 50 mm behind the V.P. 5M

Solution)

Projections of D	– 2M
Projections of C	– 2M
Dimensioning	– 1M



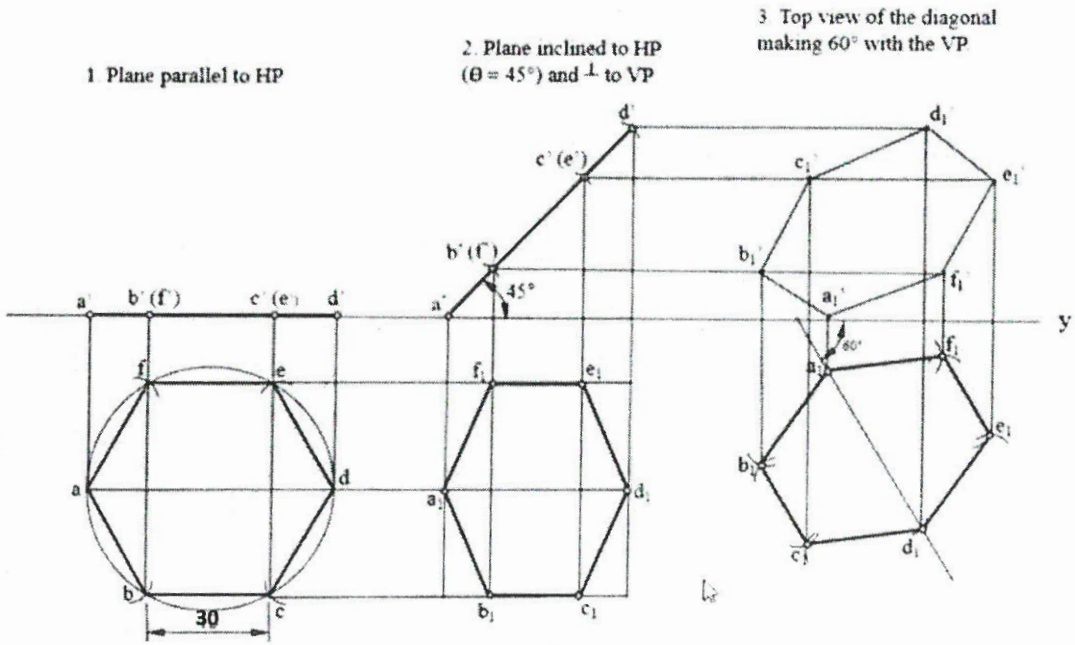
UNIT-III

5. A hexagonal plane of side 30mm has a corner on the ground. Its surface us inclined at 45^0 to the H.P. and the top view of the diagonal through the corner which is in H.P. makes an angle of 60^0 with the V.P. Draw its projections **14 M**

Solution)

Solution)

Drawing initial positions	– 4M
Drawing first stage (surface inclination) Projections	– 4M
Drawing Second stage (diagonal Inclination) Projections	– 4M
Dimensioning	– 2M

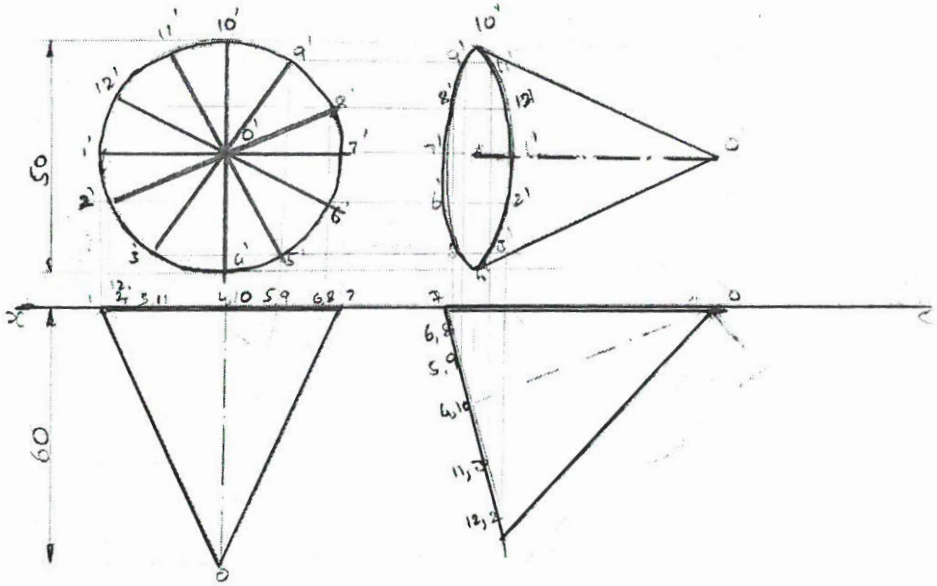


OR

6. A cone of base diameter 50mm and axis 60mm has a generator in thr V.P. and the axis parallel to the H.P. Draw its projections. **14 M**

Solution)

Drawing initial positions	– 4M
Drawing the T.V. of cone with generator on VP	– 4M
Drawing the F.V. of cone	– 4M
Dimensioning	– 2M

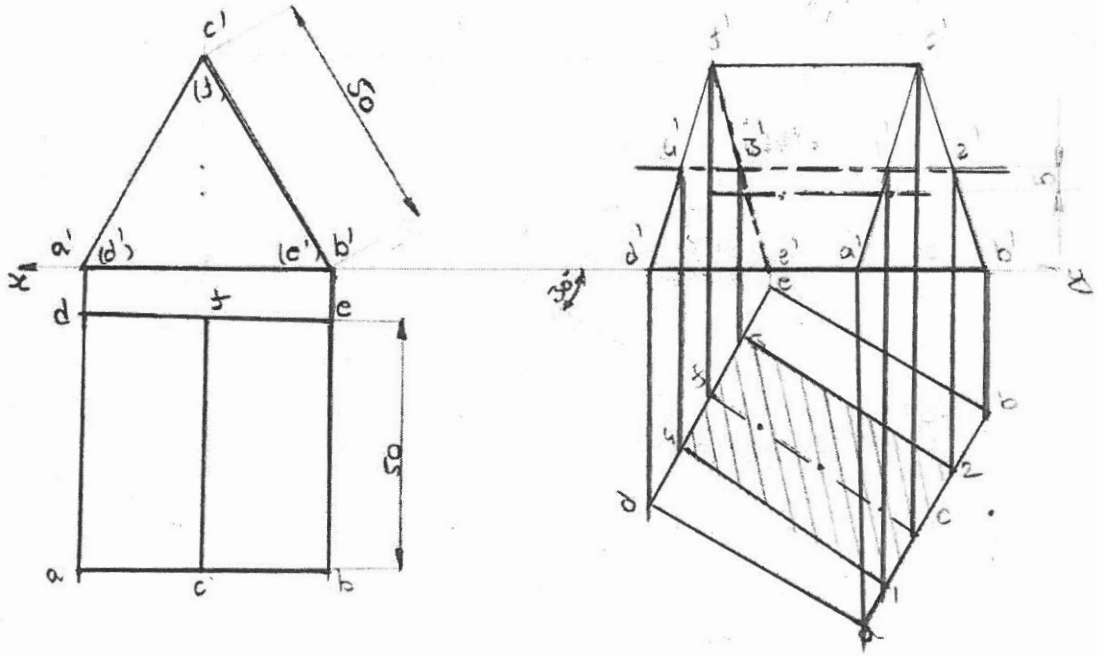


UNIT-IV

7. A triangular prism of base side 50mm and axis 50mm lies on one of its rectangular faces on the H.P. with its axis inclined at 30^0 to the V.P. It is cut by a horizontal section plane at a distance of 5mm from the axis. Draw its front view and sectional top view. **14 M**

Solution)

Drawing initial positions	– 2M
Drawing the prism in inclined position	– 3M
Drawing cutting plane	– 2M
Projecting the section plane intersection points to FV	– 3M
Hatching	– 2M
Dimensioning	– 2M

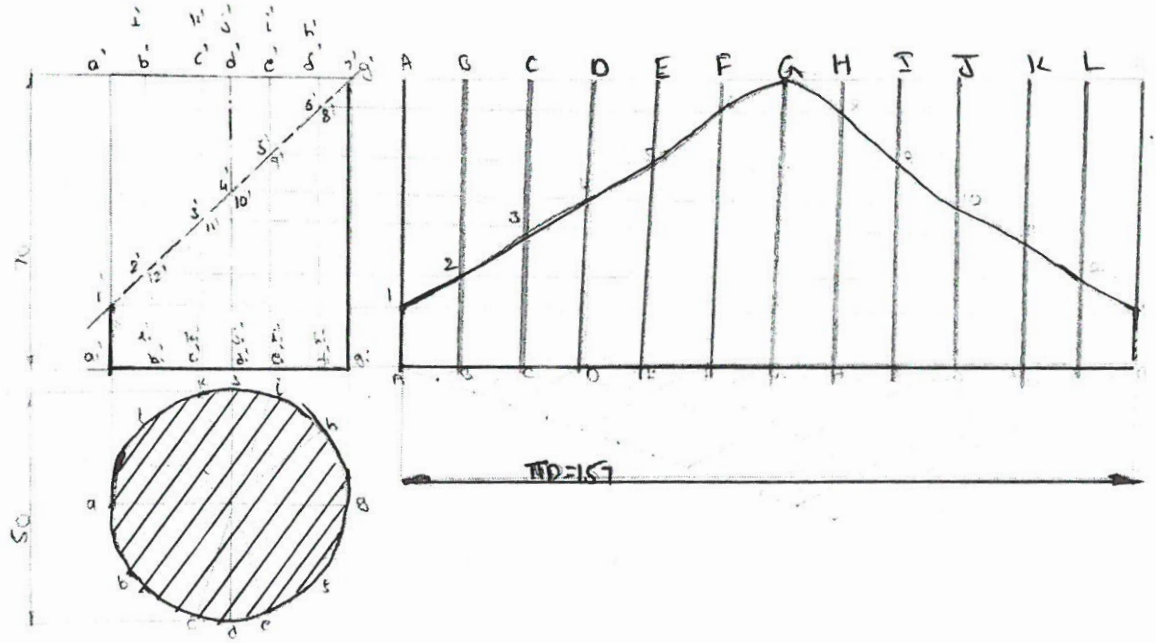


OR

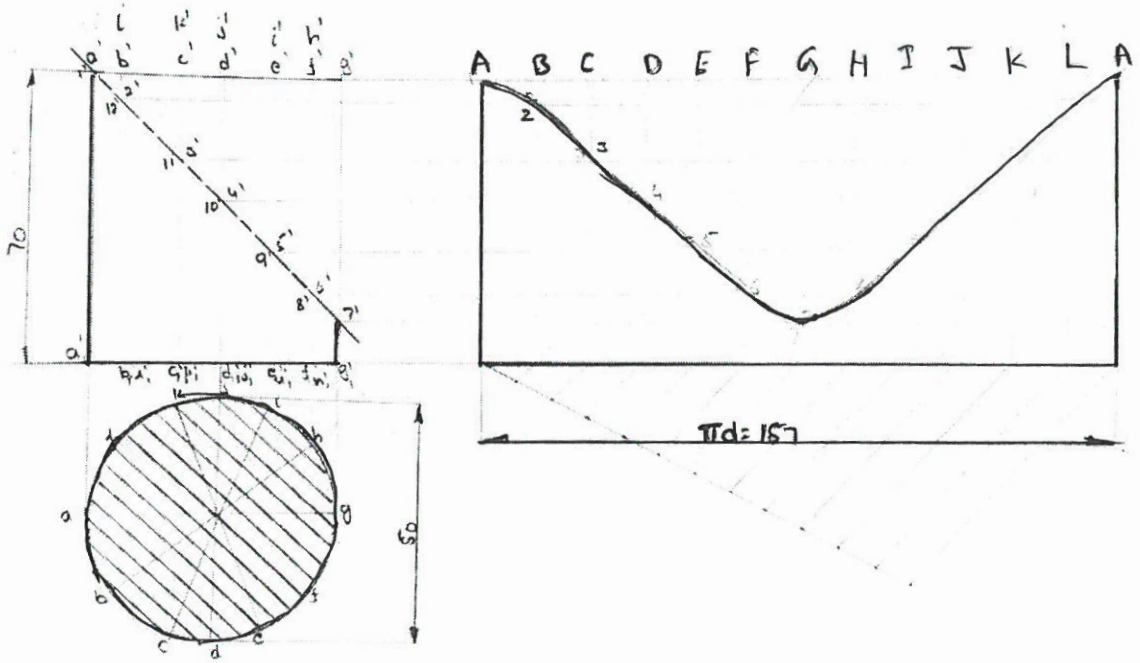
8. A cylinder of base 50mm and axis 70mm is resting on the ground with its axis vertical. It is cut by a section plane perpendicular to the V.P. inclined at 45^0 to the H.P., passing through the top of a generator and cuts all the other generators. Draw the development of its lateral surface. **14 M**

Solution)

Drawing initial positions	– 2M
Drawing cutting plane	– 2M
Development -	– 8M
Dimensioning	– 2M

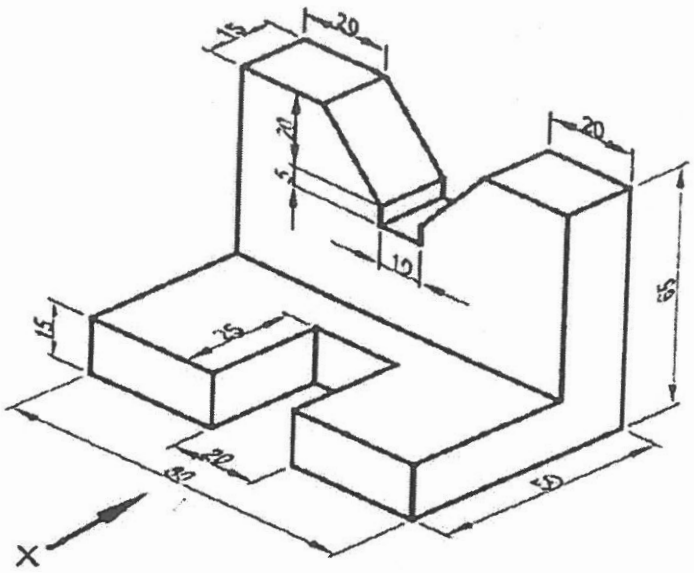


OR



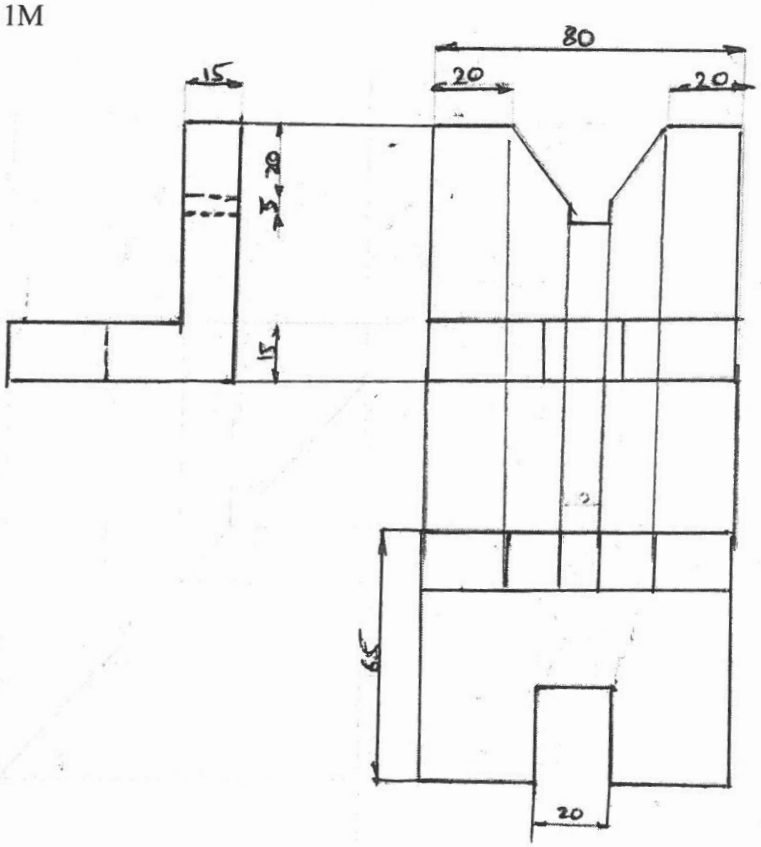
UNIT-V

9. Pictorial view of an object is shown in fig. below. Using first angle projection, draw its (a) front view, (b) top view, and (c) right-hand side view. **14 M**



Solution)

Front View – 5M
Top view – 5M
Side view – 3M
Dimensioning – 1M



OR

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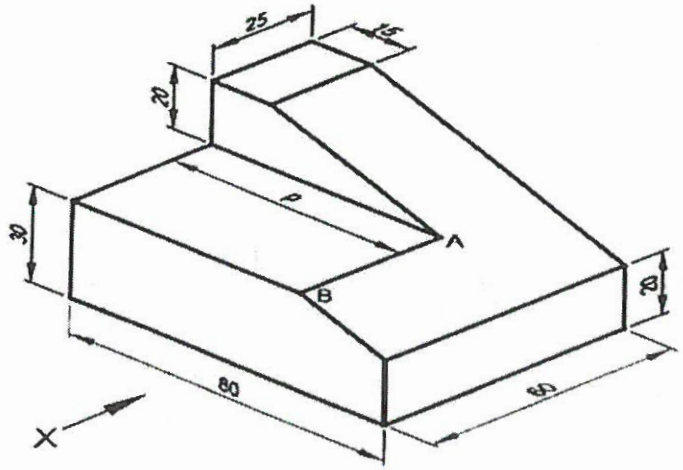
10. Pictorial view of an object is shown in fig. below. Using first angle projection, draw its (a) front view, (b) top view, and (c) right-hand side view. **14 M**



Solution)

Front View – 5M
Top view – 5M
Side view – 3M
Dimensioning – 1M