

I B.Tech Regular Examinations, May/June 2006

ENGINEERING GRAPHICS

(Common to Civil Engineering, Mechanical Engineering, Mechatronics,
Metallurgy & Material Technology, Production Engineering, Aeronautical
Engineering and Automobile Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. The area of a field is 50,000 sq.m. The length and breadth of the field, on the map are 10 cm and 8 cm respectively. Construct a diagonal scale, which can read up to one metre. Mark the length of 236 meters on the scale. Find the R.F of the scale? [16M]
2. The foci of an ellipse are 100 mm apart and the minor axis is 70 mm long. Determine the length of the major axis and draw half the ellipse by concentric circles method and the other half by Oblong method. Draw a curve parallel to the ellipse and 25 mm away from it. [16M]
3. Draw the projections of a circle of 50 mm diameter resting in the H.P. on a point A on the circumference, its plane inclined at 45 degrees to the H.P. and the diameter AB making 30 degrees angle with the V.P. [16M]
4. A hexagonal prism, has a face on the H.P. and the axis parallel to the V.P. It is cut by a vertical section plane, the H.T. of which makes an angle of 45 degrees with xy and cuts the axis at a point 20 mm from one of its ends. Draw its sectional front view and true shape of the section. Side of the base 25 mm long ; height 65mm long. [16M]
5. A hexagonal prism of side of base 30 mm and height 60 mm is resting on HP with one of its base edges parallel to VP. Right half of the solid is cut by an upward plane inclined at 60° to the ground and starting from the axis and 30 mm below the top end. The left half of the solid is cut by a plane inclined at 30° to the HP downwards from the axis. The two section planes are continues. Draw the development of the lower portion. [16]
6. Draw the isometric view of a cone 40 mm diameter and axis 55 mm long when its axis is horizontal. Draw isometric scale. [16]
7. Convert the isometric view of the picture shown in the figure1 below in to orthogonal projection of all three views. [16M]

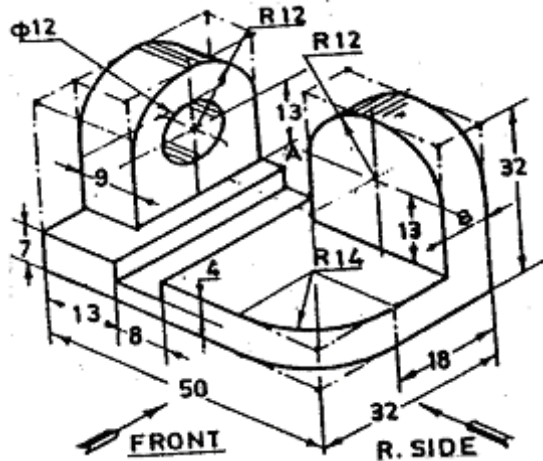


Figure 1:

- 8. Draw the perspective view of a horizontal circular lamina of 50 mm diameter resting on the ground. The center of the plane is 35 mm behind PP, the station point is in the central plane, passing through the center of the circular plane and 80 mm in front of the PP and 60 mm above the ground. [16M]

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1. An area of the land of 36 sq.km in area is represented by an area of 144 sq.cm on a map. Find R.F of the scale of this map. Draw a backward vernier scale to show kilometers, hectometers and decameters with the above R.F indicate on the scale a distance of 9 kilometers, 5 hectometers and 6 decameters. [16M]
2. Construct a hyperbola, with the distance between the focus and the directrix as 50 mm and eccentricity as $3/2$. Also, draw normal and tangent to the curve at a point 30 mm from the directrix. [16M]
3. A square ABCD of 50 mm side has its corner A in the H.P., its diagonal AC inclined at 30 degrees to the H.P. and the diagonal BD inclined at 45 degrees to the V.P. and parallel to the H.P. Draw its projections. [16M]
4. A pentagonal pyramid, base 25 mm side and axis 50 mm long has one of triangular faces in the V.P. and the edge of the base contained by that face makes an angle of 30 degrees with the H.P. Draw its projections. [16M]
5. A cone of base diameter 70mm and height 100mm rests on the hp and is penetrated by a horizontal cylinder of diameter 45mm the axis of cylinder is 9 mm away from the axis of the cone and at a distance 30mm above the base of the cone. Draw projection of the solids showing the curves of inter section between the solids. [16]
6. Draw the isometric view of a cone 40 mm diameter and axis 55 mm long when its axis is horizontal. Draw isometric scale. [16]
7. Draw the isometric view for the given orthogonal views as shown in the figure1 below . [16M]

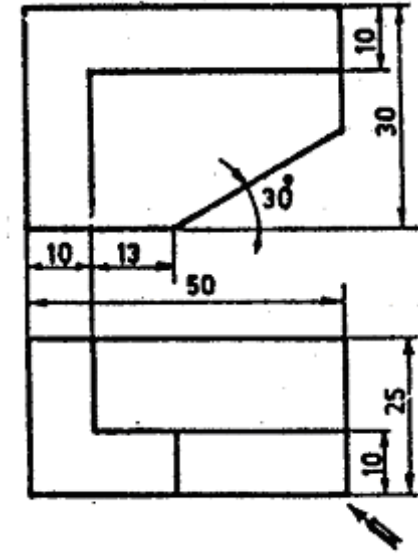


Figure 1:

8. A triangular prism whose base is an isosceles triangle of sides $40 \text{ mm} \times 30 \text{ mm} \times 30 \text{ mm}$ and axis 50 mm long rests with its base on the ground plane such that one of its vertical edge is 10 mm in front of the PP. One of the rectangular faces containing that edge is inclined at 45° to PP and in front of it. The station point is 80 mm in front of PP, 60 mm above the ground plane and lies in a central plane, which is at 10 mm to the left of the center of the prism. Draw the perspective view. [16M]

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- (a) Draw a Plain scale of 1cm= 5 metres and show on it 3.6 metres.

(b) Construct a scale of 1:4 to show centimeters and long enough to measure up to 6 decimeters and show on it a length of 4.5 decimeters. [8+8]
- The foci of an ellipse are 100 mm apart and the minor axis is 70 mm long. Determine the length of the minor axis and draw half the ellipse by concentric circles method and the other half by Oblong method. Draw a curve parallel to the ellipse and 25 mm away from it. [16M]
- Draw the projections of a circle of 60 mm diameter having end A of the diameter AB in the H.P., the end B in the V.P., and the surface inclined at 30 degrees to the H.P. and 60 degrees to the V.P. [16M]
- A hexagonal prism of base of side 40mm and axis length 80mm rests on one of its base edges on the HP. The end containing that edge is inclined at 30° to the HP and the axis is parallel to VP. It is cut by a plane perpendicular to the VP and parallel to the HP. The cutting plane bisects the axis. Draw its front and the sectional top views. [16M]
- A cone of base diameter 50 mm and axis length 70 mm rests with its base on HP. A section plane perpendicular to V.P and inclined at 35° to HP bisects the axis of the cone. Draw the development of the truncated cone. [16]
- Draw the isometric projection of a Frustum of hexagonal pyramid, side of base 30 mm the side of top face 15mm of height 50 mm. [16]
- Convert the isometric view of the picture shown in the figure1 below in to orthogonal projection of all three views. [16M]

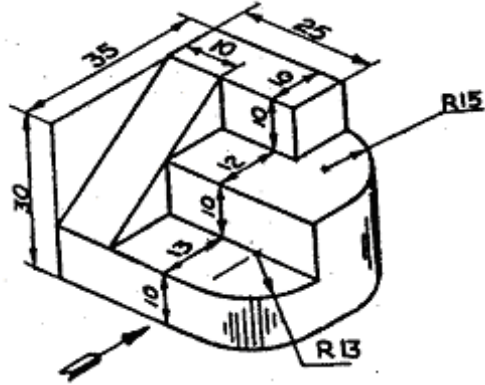


Figure 1:

8. A rectangular pyramid of base 70 mm X 50 mm and altitude of 70 mm rests with its base on the ground. One corner of the base is 20 mm to the left of the eye and in PP. The 70 mm long side of the base recedes to the right at 40° . The eye is 190 mm from PP and 130 mm above the ground plane. Draw the perspective view of the pyramid. [16M]

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1. (a) Draw a Plain scale of 1cm= 5 metres and show on it 3.6 metres.
(b) Construct a scale of 1:4 to show centimeters and long enough to measure up to 6 decimeters and show on it a length of 4.5 decimeters. [8+8]
2. Draw an ellipse, given the minor and major diameters are 100 mm and 150 mm respectively. Draw the tangent and normal at any point on the curve. [16M]
3. Draw the projections of a regular hexagon of 25 mm side, having one of its sides in the H.P. and inclined at 60 degrees to the V.P. and its surface making an angle of 45 degrees with the H.P. [16M]
4. A cylinder, 65 mm diameter and 90 mm long, has its axis parallel to the H.P. and inclined at 30 degrees to the V.P. It is cut by a vertical section plane in such a way that the true shape of the section is an ellipse having the major axis 75 mm long. Draw its sectional front view and true shape of the section. [16M]
5. A vertical cone of 40 mm diameter of base and height 50 mm is cut by a cutting plane perpendicular to V.P and inclined at 30° to the H.P so as to bisect the axis of the cone. Draw the development of the lateral surface of the truncated portion of the cone. [16]
6. Draw the isometric projection of a Frustum of hexagonal pyramid, side of base 30 mm the side of top face 15mm of height 50 mm. [16]
7. Draw the front view, top view and side view for the picture shown in figure1 below in first angle projection. [16M]

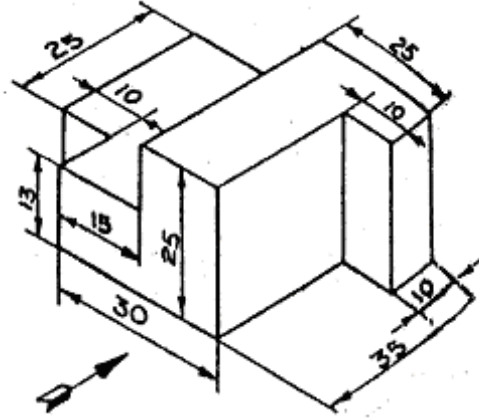


Figure 1:

8. Draw the perspective view of a point P is situated 10 mm behind the PP and 15 mm above the ground plane. The station point is 25 mm in front of the PP, 20 mm above the ground plane. It lies in a central plane 12 mm to the right of the point. [16M]
