

**I B.Tech - Regular Examinations, June 2009****ENGINEERING GRAPHICS**

( Common to Civil Engineering, Mechanical Engineering, Chemical Engineering, Bio-Medical Engineering, Mechatronics, Metallurgy &amp; Material Technology, Production Engineering, Aeronautical Engineering and Automobile Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

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1. A circle of diameter 70 mm rolls on the outside of another circle of same size without slipping. Trace the locus of a point of the circumference of the generating circle. Draw a normal and tangent to the curve at a point 35 mm above the directing curve. [16]
2. The distance between the end projectors of a line AB is 50 mm. Point A is 15 mm above HP and 10 mm in front of VP. Point B is 40 mm above HP and 40 mm in front of VP. Find the true length of the line AB, the inclinations of the line AB with HP and VP. Locate HT and VT of the line by trapezoidal method. [16]
3. A regular hexagonal lamina with its edge 50 mm has its plane inclined at  $45^\circ$  to HP and lying with one of its edges in HP. The plan of one of its diagonals is inclined at  $45^\circ$  to XY. The corner nearest to VP is 15 mm in front of it. Draw its projections. [16]
4. Draw the development of the lateral surface of the part P of the cylinder whose front view is shown in figure 4. All dimensions are in cm. [16]

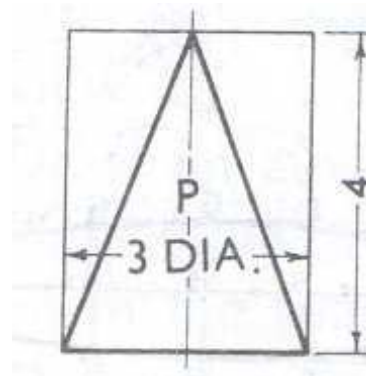


Figure 4

5. A cylinder of 75 mm diameter, standing on its base on H.P, is completely penetrated by another cylinder of 55 mm diameter, with their axes intersecting at right angle. Draw the projections, showing the lines of intersection, assuming that the axis of the smaller cylinder is parallel to V.P. [16]
6. Draw the isometric view of the object whose orthographic projections are given in figure 6. All dimensions are in mm. [16]



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1. A circle of 50 mm diameter rolls on a horizontal line for half revolution and then on a vertical line for another half revolution. Draw the curve traced out by a point P on the circumference of the circle, taking the topmost point on the rolling circle as the initial position of the generating point. [16]
2. A 100 mm line AB, measures 70 mm in top view and 80 mm in profile view. The end A 80 mm from profile plane, 90 mm above HP and 30 mm in front of VP. Draw the front view and top view of the line and find its inclinations with HP and VP. [16]
3. Draw the projections of frustum of a right circular cone, base 60 mm diameter, top face 30 mm diameter, and axis 40 mm long resting on one of its generators in VP and parallel to HP. [16]
4. Draw the development of the lateral surface of the part P of the cone whose front view is shown in figure 4. All dimensions are in cm. [16]

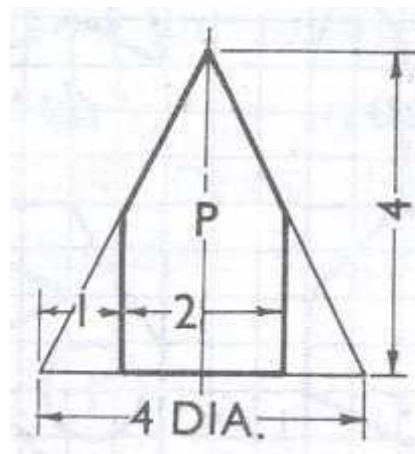
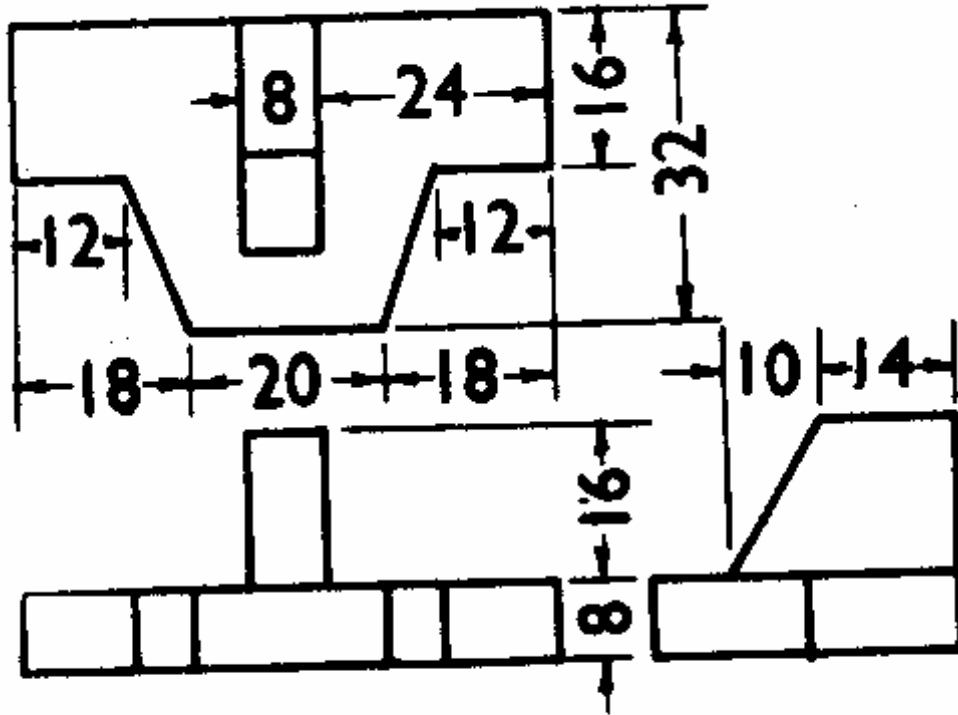


Figure 4

5. A vertical cylinder of 70 mm diameter, is penetrated by a horizontal cylinder of the same size. The axis of the horizontal cylinder is parallel to both H.P and V.P and is 10 mm away from the axis of the vertical cylinder. Draw the projections, showing the lines of intersection. [16]

6. Draw the isometric view of the object whose orthographic projections are given in figure 6. All dimensions are in mm. [16]



**(Third-angle projection)**

Figure 6

7. Draw the following views of the object given in figure 7. All dimensions are in mm.
- Front View
  - Top View and
  - Side View from the left.
- [16]

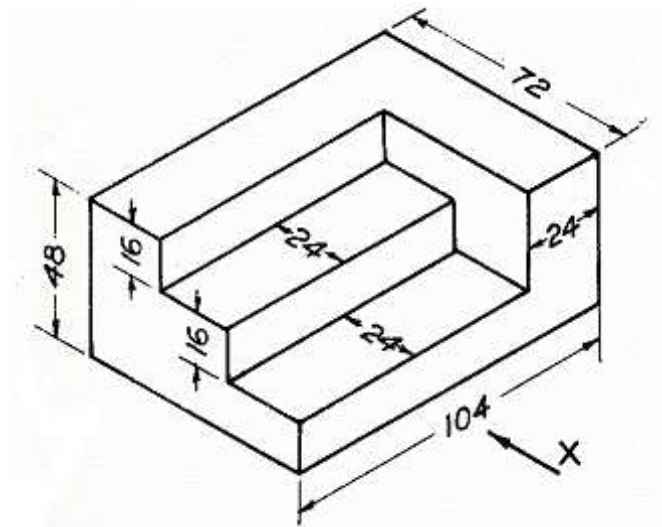


Figure 7

8. A hexagonal pyramid of base 25 mm side and axis 50 mm, is resting on the ground on one of its base with one side of the base parallel to and 20 mm behind picture plane. The station point is 60 mm above the ground plane and 80 mm in front of the picture plane and lies 50 mm to the left of the central plane, passing through the axis of the solid. Draw the perspective view of the pyramid. [16]

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1. A disc is in the form of a square of 30 mm side, surmounted by semicircles on opposite sides. Draw the path of the end of a string unwound from the circumference of the disc. [16]
2. The top view of a 75 mm long line CD measures 50 mm. C is 50 mm in front of the V.P. and 15 mm above the H.P. D is 15 mm in front of the V.P. and is above the H.P. Draw the front view of CD and find its inclinations with the H.P. and the V.P. Show also its traces. [16]
3. A cube of side 40 mm is resting on ground on one of its faces. All the vertical faces of the cube are equally inclined to VP. It is cut by a section plane perpendicular to VP and inclined to HP, so that the true shape of the section is a regular hexagon. Draw the projections, sectional top view and true shape of the section. [16]
4. A right regular hexagonal prism, base 30 mm side and axis 60 mm has a face on ground and axis parallel to VP. It is cut by a plane perpendicular to HP and inclined at  $45^{\circ}$  to HP and passing through a point on the axis 20 mm from the base. Draw the projections and development of the sectioned solid. [16]
5. A horizontal steam boiler of 3m diameter is surmounted by a dome of the shape of a vertical cylinder of 1.4m diameter. Draw the projections showing the curves of intersection, when their axes intersect each other at right angles. [16]
6. Draw the isometric projection of the object whose orthographic projections are given in figure 6. All dimensions are in mm. [16]

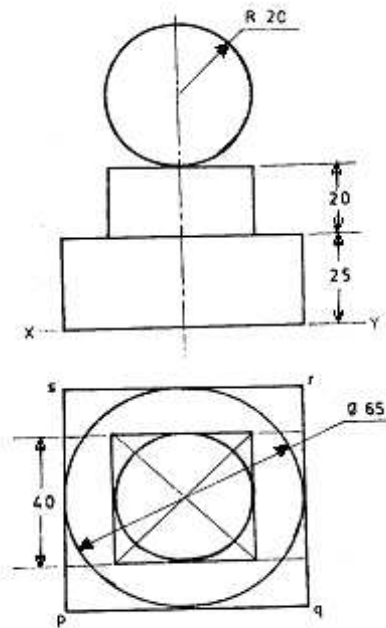


Figure 6

7. Draw the following views of the bearing block given in figure 7. All dimensions are in mm.

- (a) Front View
- (b) Top View and
- (c) Side View.

[16]

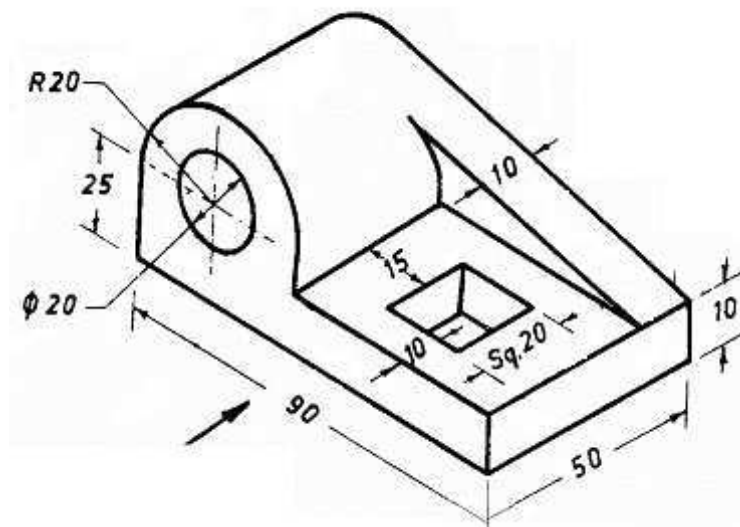


Figure 7

8. A hexagonal plane of 30 mm side lies on the ground plane. One of its corners is touching the picture plane and an edge is perpendicular to picture plane. The

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station point is 30 mm in front of the picture plane, 60 mm above the ground plane and lies in a central plane which passes through the centre of lamina. Draw the perspective view. [16]

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- Two fixed points A and B are 100 mm apart. Trace the complete path of a point P moving in such a way that the sum of its distances from A and B is always the same and equal to 125 mm. Name the curve. Draw a tangent and normal to the curve through a point 30 mm above AB line. [16]
- A line AB 70 mm long is inclined at an angle of  $40^\circ$  to the HP and  $30^\circ$  to the VP. The end A is in VP and 30 mm above HP. Draw the projections of the line and locate traces. [16]
- A pentagonal prism of base edge 25 mm and height 40 mm rests on one of the lateral faces in HP with the base edge contained in that face is normal to VP. A vertical sectional plane inclined to VP at  $30^\circ$  cuts the prism bisecting its axis. Draw the sectional top view and elevation. Also find the true shape of the section. [16]
- Draw the development of the lateral surface of the part P of the cone whose front view is shown in figure 4. All dimensions are in cm. [16]

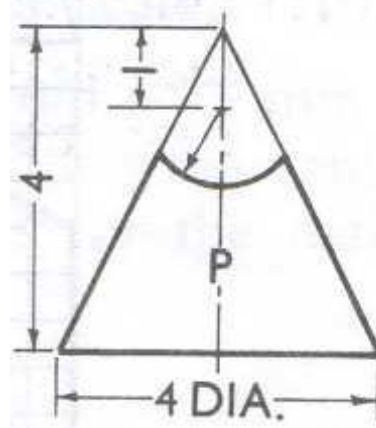


Figure 4

- A vertical cone of 80 mm diameter and axis 100 mm long, is penetrated by horizontal cylinder of 60 mm diameter and 90 mm long such that, its axis is 5 mm behind the axis of the cone, at a height of 40 mm above its base. show the lines of intersection, when the axes of both solids are parallel to V.P. [16]

6. Draw the isometric view of the object whose orthographic projections are given in figure 6. All dimensions are in mm. [16]

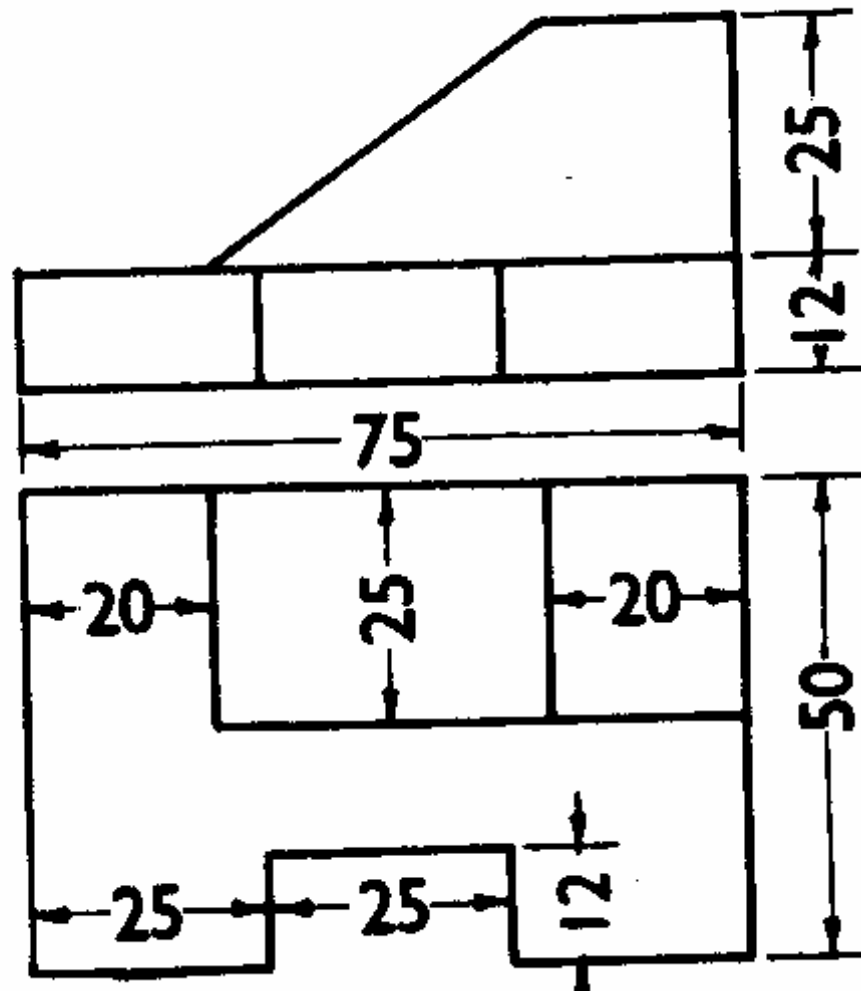


Figure 6

7. Draw the following views of the angular block given in figure 7. All dimensions are in mm. [16]
- (a) Front View
  - (b) Top View and
  - (c) Side View.

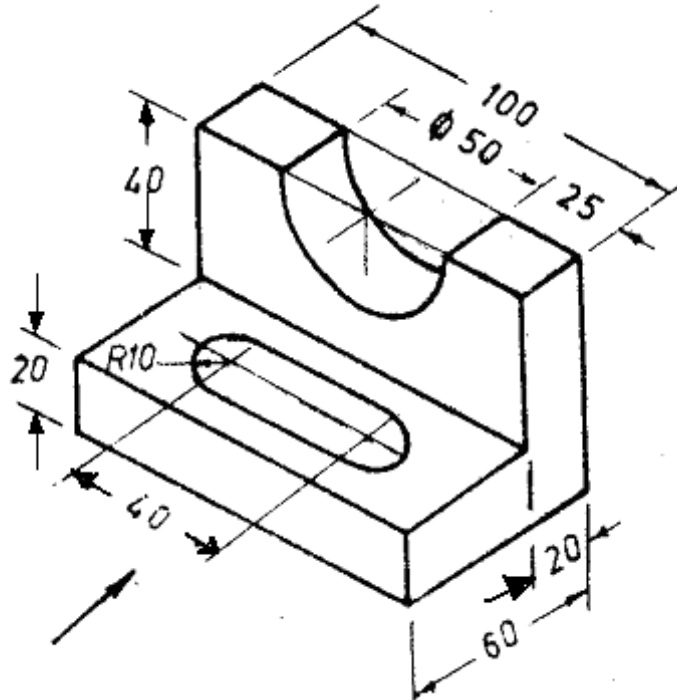


Figure 7

8. Draw the perspective view of a hexagonal prism lying on the ground plane on one of its longer edges such that one of its rectangular faces is perpendicular to the ground plane. The axis is inclined at  $30^\circ$  to the picture plane and an edge of the base is touching the picture plane. The station point is 110mm in front of the PP, 95 mm above the ground plane and lies in a central plane which bisects the axis. For the prism, side of base is 25 mm and height 75 mm. [16]

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