

I B.Tech Supplementary Examinations, Aug/Sep 2008

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. An area of 144 sq.cm on a map represents an area of 36 sq.km on the field. Find the R.F of the scale for this map and draw a Diagonal scale to show kilometers, hectameters and decameters and to measure up to 10 kilometers. Indicate on the scale a distance of 7 kilometers, 5 hectometers and 6 decameters. [16M]
2. Construct a rectangular hyperbola, when a point P on it is at a distance 30 mm and 40 mm from two asymptotes. Also, draw a tangent to the curve at a point 35 mm from an asymptotes. [16M]
3. A line PQ 75 mm long , has its end P in the V.P. and the end Q in the H.P. The line is inclined at 30 degrees to the H.P. and at 60 degrees to the V.P. Draw its projections. [16M]
4. A sphere of 75 mm diameter is cut by a section plane, perpendicular to the V.P. and inclined at 30 degrees to the H.P. in such a way that the true shape of the section is a circle of 50 mm diameter. Draw its front view, sectional top view and sectional side view. [16M]
5. A solid is in the form of a square prism of side of base 30 mm up to a height of 50 mm and thereafter tapers into frustum of a square pyramid whose top surface is a square of 15 mm side. The total height of the solid is 70 mm. Draw the development of the lateral surface of the solid. [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 elevation, plan and side view of the picture shown in the figure 7. [16]

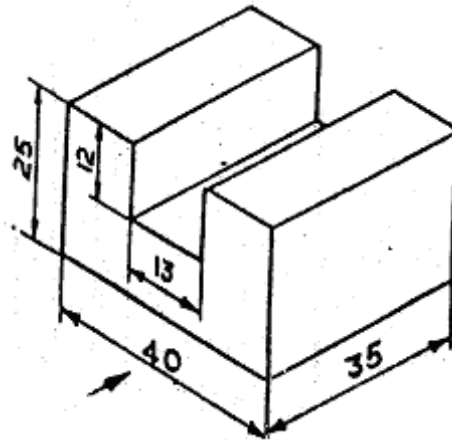


Figure 7

8. A straight line CD, 45 mm long is parallel to and 12 mm above the ground. It is inclined at 30° to the picture plane and its end C 25 mm behind the picture plane. The station point is 60 mm in front of the picture plane, 48 mm above the ground plane, and is contained by a central plane passing through the mid point of the given line CD. Draw its perspective view. [16]

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1. A rectangular plot of land area 2.0 hectares is represented on a map by a similar rectangle of 8 sq.cm. Calculate the R.F of the scale of the map. The scale should be long enough to measure up to 600 meters. Show a length of 459 m. [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 semi circular plate of 80 mm diameter has its straight edge in the V.P. and inclined at 45 degrees to the H.P. The surface of the plate makes an angle of 30 degrees with the V.P. Draw its projections. [16M]
4. A cone of base diameter 60 mm and altitude 75mm lies on the HP on one of its generators. The plan of the axis is inclined at 45^0 to the VP. Draw its projections. [16M]
5. A vertical hexagonal prism of 25 mm side of base and axis 60 mm has one of its rectangular faces parallel to VP. A circular hole of 40 mm diameter is drilled through the prism such that the axis of the hole bisects the axis of the prism at right angle and is perpendicular to VP. Draw the development of the lateral surface of the prism showing the true shape of the hole in it. [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 front view, top view and side view for the picture shown in figure 7 in first angle projection. [16]

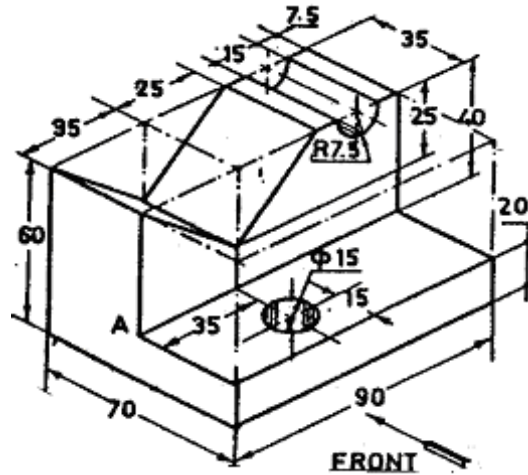


Figure 7

8. Draw the perspective view of a right regular hexagonal prism, edge of base 25 mm and 60 mm long lying on ground on one of its rectangular faces such that its axis is inclined at 30° to the picture plane and one of its vertical edges touching the picture plane. The station point is 80 mm in front of the picture plane, and lies in a central plane bisecting the axis. The horizon is in the level of the rectangular faces of the prism. [16]

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1. On a map, the distance between two points is 14 cm. The real distance between them is 20 Km. Draw a Diagonal scale of this map to read kilometers and hecta meters, and to measure up to 25 Km. Show a distance of 17.6 Km on this 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 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]
3. 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]
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 vertical cylinder of 50 mm diameter is penetrated by a horizontal cylinder of same size with their axes intersecting. Draw the curves of intersections if the axis of the horizontal cylinder is inclined at 45° to VP [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 elevation, plan and side view of the picture shown in the figure 7. [16]

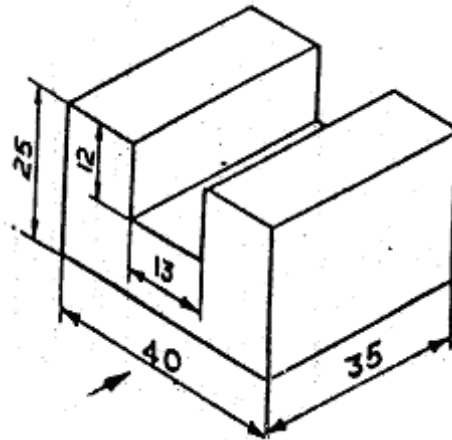


Figure 7

8. Draw the perspective view of a cube of 25 mm edge resting on ground plane on one of its faces. It has one of its vertical edges in the PP and all vertical faces are equally inclined to the picture plane. The station point is 55 mm in front of the picture plane, 40 mm above the ground plane and is contained by a central plane 9 mm to the left of the center of the cube. [16]

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1. Construct a diagonal scale to read kilometers, hectameters and decameters and long enough to measure up to 6 kilometers, When a line of length 1cm on the map represents a distance of 0.5 kilometers. Calculate the R.F and indicate a distance of 2.45 kilometers on the scale. [16M]
2. Construct a hypocycloid, rolling circle 60 mm diameter and directing circle 180 mm diameter. Draw a tangent to it at a point 60 mm from the center of the directing circle. [16M]
3. A semi circular plate of 80 mm diameter has its straight edge in the V.P. and inclined at 45 degrees to the H.P. The surface of the plate makes an angle of 30 degrees with the V.P. Draw its projections. [16M]
4. (a) A cone base 50mm diameter and axis 60 mm long rests with its base on HP. It is cut by a section plane perpendicular to HP and inclined at 60° to VP and at a distance of 10mm from its axis. Draw the sectional front view and the true shape of the section.
(b) A hexagonal prism side of base 30mm and axis 60mm long, rests with its base on HP such that one of its rectangular faces is parallel to VP. A section plane perpendicular to HP and parallel to VP cuts the prism at a distance of 10mm from its axis. Draw its top and sectional front view. [16M]
5. A cone of base diameter 80 mm and height 125 mm stands with its base on the HP. It is penetrated by a horizontal cylinder of diameter 35 mm. If the axes of the two solids intersect at a point on the cone's axis 40 mm above the base, draw the projections of the curves of intersection. [16]
6. A pentagonal pyramid 30 mm edge of base and 65 mm height stand on HP such that an edge of base is parallel to VP nearer to it. A section plane perpendicular to VP and inclined at 30° to HP cuts the pyramid passing through a point on the axis at a height of 35 mm from the base. Draw the isometric view of the truncated pyramid showing the cut surface. [16]
7. Draw the elevation, plan and side view of the picture shown in the figure 7. [16]

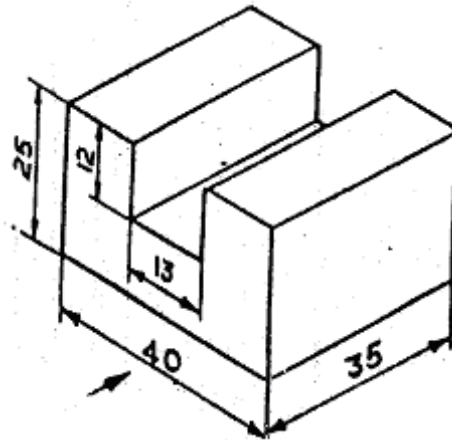


Figure 7

8. Draw the perspective view of a right regular hexagonal prism, edge of base 25 mm and 60 mm long lying on ground on one of its rectangular faces such that its axis is inclined at 30° to the picture plane and one of its vertical edges touching the picture plane. The station point is 80 mm in front of the picture plane, and lies in a central plane bisecting the axis. The horizon is in the level of the rectangular faces of the prism. [16]
