

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 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. A circle of 60 mm diameter rolls on a horizontal line for half a revolution clock - wise and then on a line inclined at 60 degrees to the horizontal for another half, clock - wise. Draw the curve traced by a point P on the circumference the circle, taking the top most point on the rolling circle as generating point in the initial position. [16M]
3. A regular hexagon of 40 mm side has a corner in the H.P. Its surface is inclined at 45 degrees to the H.P. and the diagonal through the corner which is in the H.P. makes an angle of 30 degrees with the V.P. Draw its projections. [16M]
4. (a) A cone of base 50 mm diameter and axis 65mm long, lies on HP on of its generators with its axis parallel to VP. A horizontal section plane bisects the axis of the cone. Draw the front and sectional top views.
(b) A square prism, side of base 30mm and axis 60mm long, rests with its base on HP and one of its rectangular faces is inclined at 30° to VP. A section plane perpendicular to VP and inclined at 60° to HP cuts the axis of the prism at a point 20mm from its top end. Draw the sectional top view and true shape of the section. [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 view of a cone 40 mm diameter and axis 55 mm long when its axis is horizontal. Draw isometric scale. [16]
7. Convert the orthogonal projections shown in figure 7 into an isometric view of the actual picture. [16]

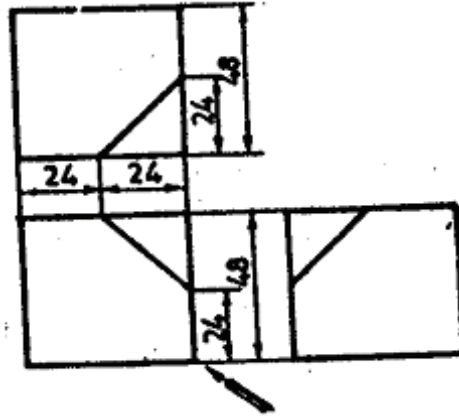


Figure 7

8. A square is resting on ground plane on one of its corners and is some distance behind VP. Its plane is perpendicular to HP and inclined at 30° to the VP and the sides containing the corner are equally inclined to the HP. Determine the line of heights for points lying in its top view and then draw its perspective view from the given position of the station point. [16]

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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. Draw a rectangle having its sides 150 mm and 75 mm long. Inscribe two parabolas in it with their axis bisecting each other. [16M]
3. A line AB 75mm long has its end A in the H.P. and 12 mm in front of V.P. the line is inclined at 60 degrees to H.P. and 30 degrees to V.P. Draw projections. [16M]
4. A hexagonal pyramid, base 25 mm side and axis 55 mm long, has one of its slant edges on the ground . A plane containing that edge and the axis is perpendicular to the H.P. and inclined at 45 degrees to the V.P. Draw its projections when the apex is nearer the V.P. than the base. [16M]
5. A cylinder of diameter of base 60 mm altitude 80 mm stands on its base. It is cut into two halves by a plane perpendicular to the VP and inclined at 30° to HP. Draw the development of the lower half. [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]

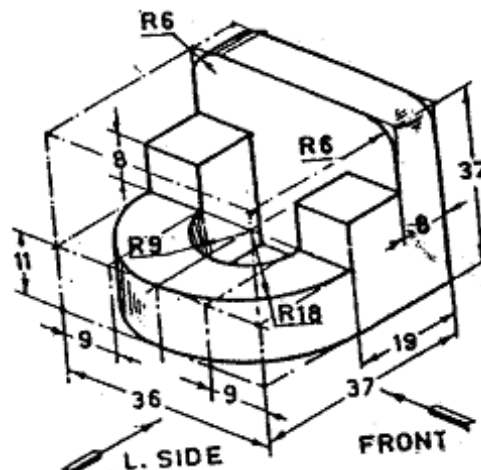


Figure 7

8. Draw the perspective view of a straight line AB, 35 mm long parallel to both the picture plane and ground plane, and 7 mm above the ground plane, and 18 mm behind the picture plane. The station point is 50 mm in front of the picture plane, 36 mm above the ground plane and is contained by a central plane 16 mm to the left of end A. [16]

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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 inferior epitrochoid of base circle 150 mm diameter and rolling circle 50 mm diameter. The tracing point P is 20 mm from the center of the rolling circle. [16M]
3. A circular plate of negligible thickness and 50 mm diameter appears as an ellipse in the front view, having its major axis 50 mm long and minor axis 30 mm long . Draw its top view when the major axis of the ellipse is horizontal. [16M]
4. 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 30^0 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]
5. A vertical cylinder of 50 mm diameter and 75 mm long is penetrated by a horizontal cylinder of 40 mm diameter and 75 mm long such that their axes bisect each other at right angles. Draw the intersection curve. [16]
6. A pentagonal prism of base 40 mm and axis 70 mm long has a central triangular hole of side 30 mm cut through one of the rectangular faces. Draw the isometric view of the prism. [16]
7. Draw the elevation, plan and side view of the picture shown in the figure 7. [16]

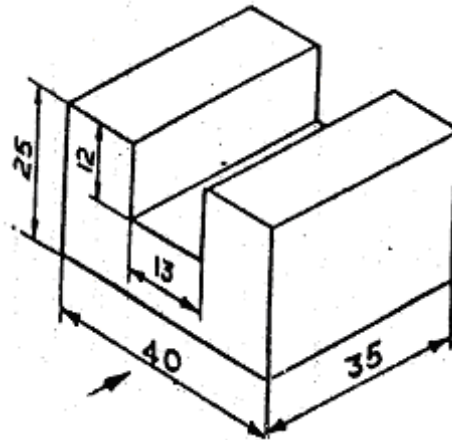


Figure 7

8. A square is resting on ground plane on one of its corners and is some distance behind VP. Its plane is perpendicular to HP and inclined at 30° to the VP and the sides containing the corner are equally inclined to the HP. Determine the line of heights for points lying in its top view and then draw its perspective view from the given position of the station point. [16]

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1. Construct a diagonal scale of 1:5000 to show single metre and long enough to measure 300 meters. Mark on the scale a distance of 285.5 meters. [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. Three lines OA, OB and OC are respectively 25 mm, 45 mm 65 mm long, each making 120 degrees angles with the other two and the shortest line being vertical. The figure is the top view of the three rods OA, OB and OC whose ends A, B and C are on the ground, while O is 100 mm above it. Draw the front view and determine the length of each rod and its inclination with the ground. [16M]
4. A cone of base 55mm diameter and axis 65mm long, rests with its base on HP. A section plane perpendicular to both HP and VP cuts the cone at a distance of 8mm from its axis. Draw its top view, front view and sectional side view. [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. A sphere of diameter 40 mm rests centrally on the top of a square frustum, base 60 mm top 40 mm and height 75 mm. Draw the isometric view of the combination of solids. [16]
7. Draw the elevation, plan and side view of the picture shown in the figure 7. [16]

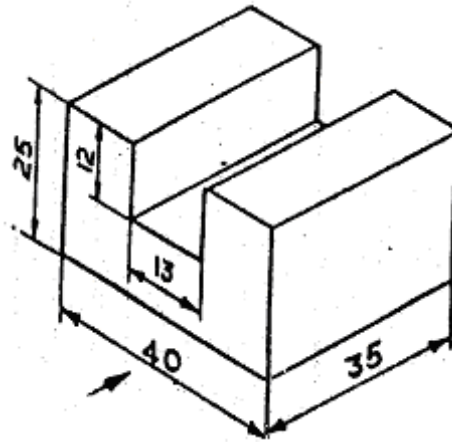


Figure 7

8. A point A is situated 20 mm behind the picture plane and 12 mm above the ground plane. The station point is 32 mm in front of the picture plane, 26 mm above the ground plane. It lies in a central plane 14 mm to the right of the point. Draw the perspective view of the point. [16]
