

Code No: 09A10191

R09

SET-1

**B. Tech I Year Examinations, December-January, 2011-2012**

**ENGINEERING DRAWING**  
(COMMON TO CE, BME, MCT, ETM, MIM)

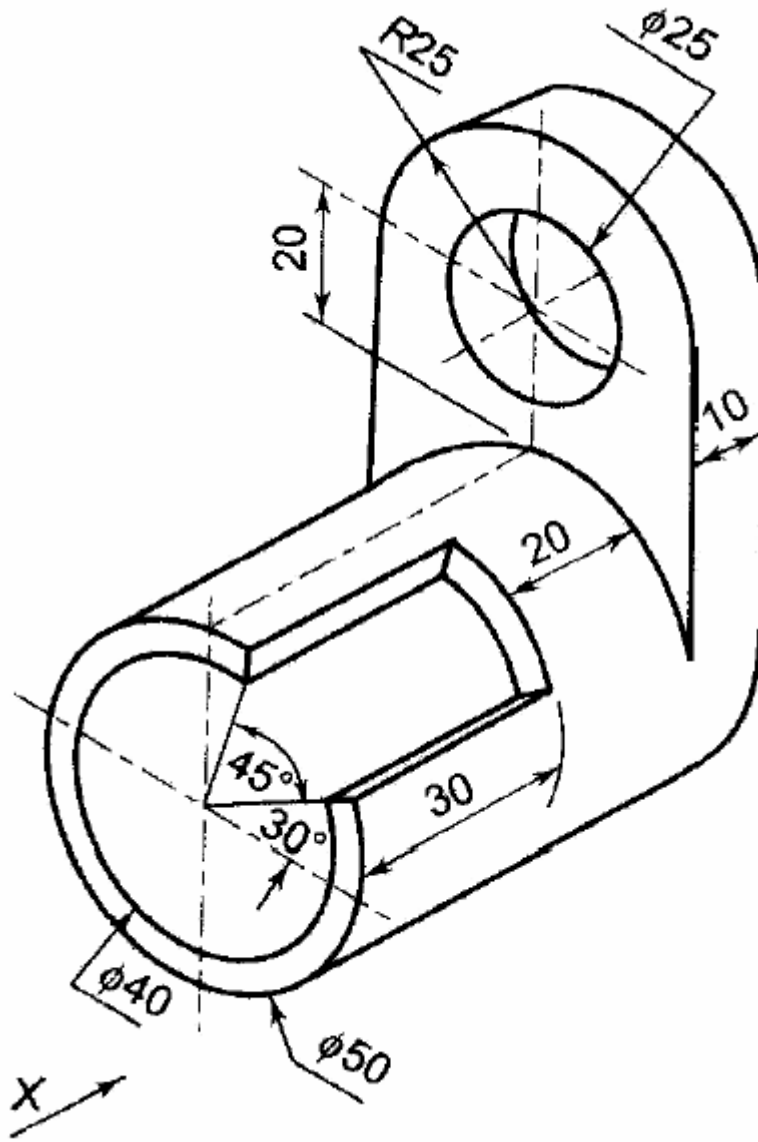
**Time: 3 hours**

**Max. Marks: 75**

**Answer any five questions**  
**All questions carry equal marks**

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1. A circle having a 50 mm diameter rolls within a circle with a 150 mm diameter with internal contact. Draw the locus of a point lying on the circumference of the rolling circle for its complete turn. Name the curve. Also draw a tangent and a normal to the curve, at a point that is 40 mm from the centre of the bigger circle. [15]
2. A line PQ, inclined at  $45^{\circ}$  to the V.P., has a 60 mm long front view. The end P is 10 mm from both the principal planes while the end Q is 45 mm above the H.P. Draw the projections of the line and determine its true length and inclinations with the principal planes. Also, locate its traces. [15]
3. An equilateral triangular plane with a 60 mm side has a side inclined at  $45^{\circ}$  to the H.P. Its H.T. is parallel to and 25 mm below xy and its V.T. does not exist. Draw its projections. [15]
4. A square prism is resting on one of its bases on the H.P. with an edge of the base perpendicular to the V.P. It is cut by an A.I.P. such that the true shape of the section is a rectangle with 80 mm and 50 mm sides. The minimum height of one of the side faces of cut prism is 15 mm. Draw its projections and true shape of the section. [15]
5. A cone, diameter of base 90 mm and altitude 80mm rests with its base on ground. A vertical cylinder of 40 mm diameter has its axis 5 mm in front of that of the cone and the axes are contained in a plane making an angle of 30 degrees with the VP. Draw the curves of penetration of the surface. [15]
6. A solid is in the form of a cylinder of base diameter 50 mm up to a height of 60 mm and thereafter tapers into a frustum of a cone of top diameter 30 mm. The total height of the solid is 90 mm. Draw the isometric projection of the solid. [15]
7. Draw the elevation, top view and side view of the object shown in figure. All dimensions are in mm. [15]



8. Draw the perspective view of a frustum of a square pyramid with 40 mm edges at the base, 30 mm at the top, and 50 mm in height. The frustum is resting on its base with its base edges equally inclined to the picture plane and one of the base corners touching it. The station point is 80 mm in front of the picture plane, 15 mm to the left of the axis of the frustum, and 60 mm above the ground plane. [15]

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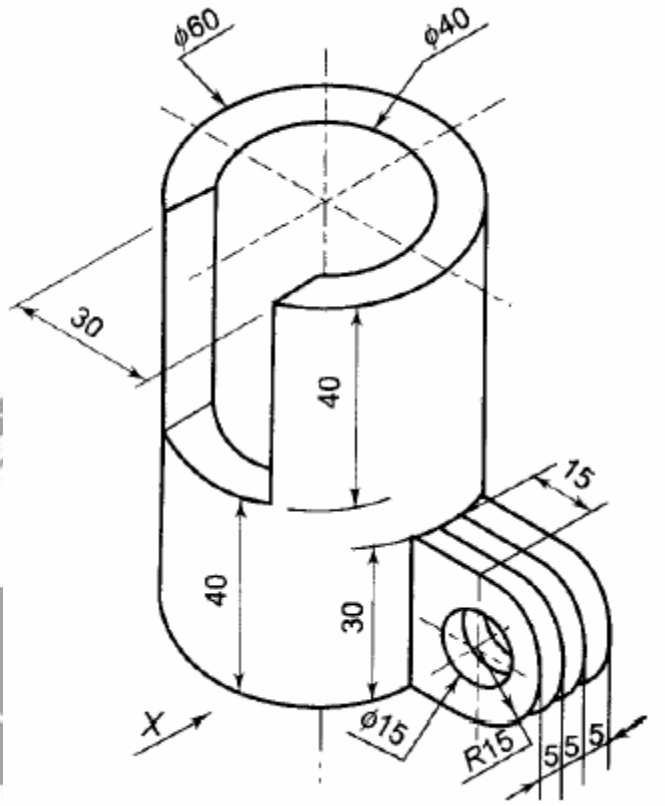
**Time: 3 hours**

**Max. Marks: 75**

**Answer any five questions**  
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1. Construct two branches of a hyperbola when its transverse axis is 50 mm long and foci are 70 mm apart. Locate its directrix and determine the eccentricity. [15]
2. A 75 mm long line PQ is inclined at an angle of  $30^{\circ}$  to the H.P. The end P is 20 mm above the H.P. and on the V.P. The end Q is 60 mm in front of the V.P. Draw the projections of the line and locate its traces. [15]
3. A hexagonal pyramid, having base with a 30 mm side and a 75 mm long axis, has one of its base edge is on the H.P., and vertical plane containing this edge and the axis is inclined at  $30^{\circ}$  to the V.P. Draw its projections when apex is 15 mm in front of the V.P. [15]
4. A thin glass vessel, with a 60 mm base diameter and a 75 mm height, is completely filled with water. It is then tilted on the rim of its base circle such that the base makes an angle of  $30^{\circ}$  to the H.P. In the process, some water from it is drained out. Draw the projections of the cylindrical vessel showing remaining water in it. [15]
5. A vertical cone 80 mm diameter of base and axis 100 mm long is penetrated by a vertical cylinder of 60 mm diameter and 100 mm long such that the top circular end of the cylinder contains the apex of the cone and a plane perpendicular to both HP and VP containing the axes of both the solids and the axis of the cylinder is at a distance of 10 mm from the axis of the cone and is towards the observer. Draw the top and front view of the solids showing the curves of intersection. [15]
6. A masonry pillar is in the form of a frustum of a hexagonal pyramid. The pillar is of 2 m height and side of its base and top base are 0.5 m and 0.3 m respectively. Draw its isometric projection. [15]
7. Draw the elevation, top view and side view of the object shown in figure. All dimensions are in mm. [15]



8. A square pyramid 45 mm base edge and 50 mm axis rests on its base on the ground such that two parallel base edges recede at  $30^\circ$  to the right of PP with the nearest corner of base 10 mm behind PP. The station point is 45 mm in front of PP and 70 mm above ground and 10 mm to the right of the nearest corner. Draw the perspective projection of the solid. [15]

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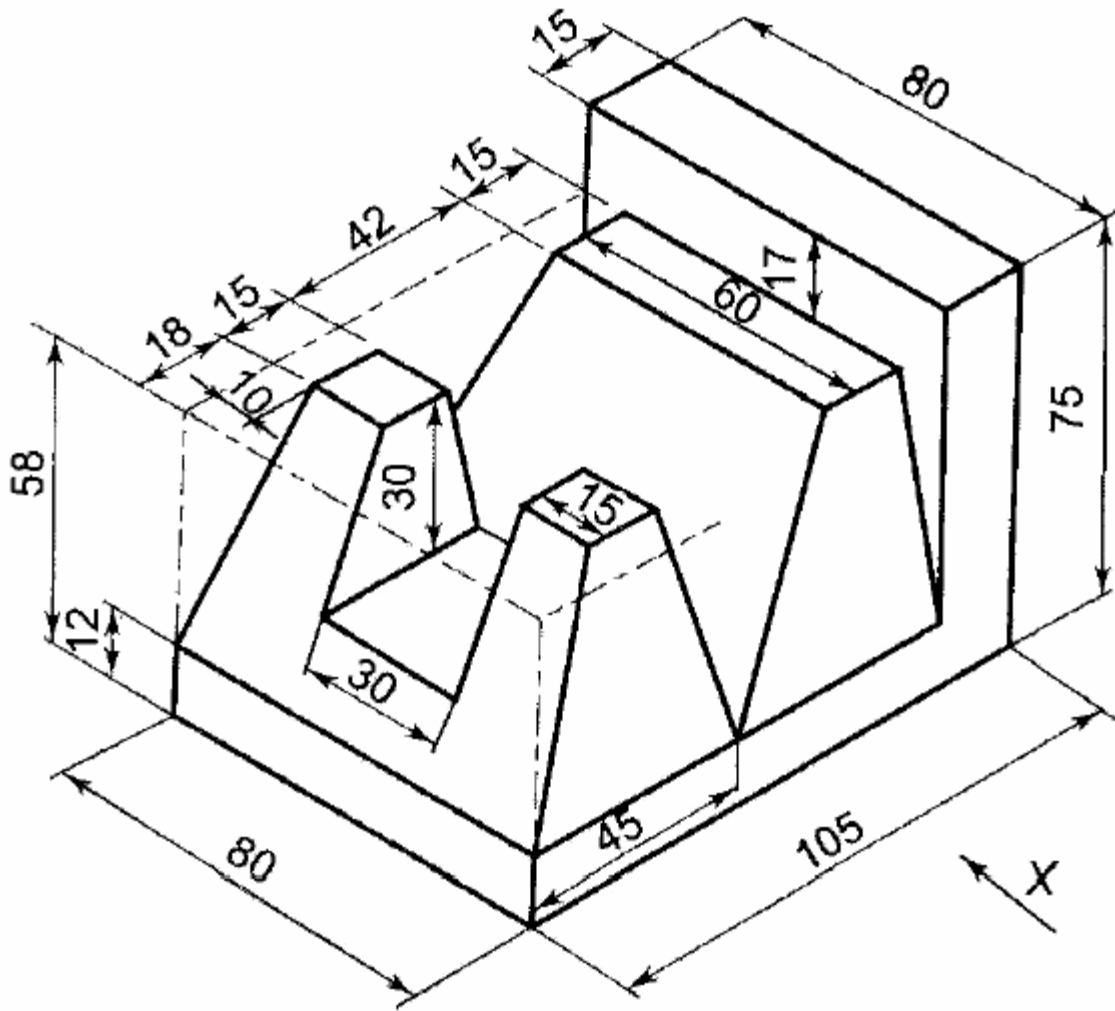
**Time: 3 hours**

**Max. Marks: 75**

**Answer any five questions**  
**All questions carry equal marks**

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1. The distance between two stations is 130km. a train covers this distance in 2.5 hours. Construct a plain scale to measure time upto a single minute. The RF of the scale is 1:260000. Find the distance covered by the train in 45 minutes. [15]
2. A 120 mm long line PQ, is inclined at  $45^{\circ}$  to the H.P. and  $30^{\circ}$  to the V.P. A point M lies on the line at a distance of 40 mm from P and its front view is 50 mm above the xy line and the top view is 35 mm below the xy line. Draw its projections and locate its traces. [15]
3. A square slab having base with a 60 mm side and 20 mm thickness is resting on its base on the ground with an edge inclined at  $30^{\circ}$  to the V.P. A cone of base with a 50 mm diameter and 60 mm axis is placed centrally over the slab such that the axes of the solids coincide. Draw the projections of the composite solid. [15]
4. A cylinder, with a 50 mm base diameter and a 70 mm long axis, is kept on the H.P. on its base. It is cut by an A.I.P. such that the true shape of the section is the largest possible ellipse. Draw its front view, sectional top view and true shape of the section. [15]
5. A vertical square prism with 50 mm sides and 100 mm length has its side faces equally inclined to the VP. It is completely penetrated by a horizontal cylinder 60 mm in diameter and 100 mm in length. The axes of the two solids bisect each other perpendicularly. Draw the projections showing curves of intersection when the plane containing the two axes is parallel to the VP. [15]
6. Draw isometric view of a cylinder of base diameter 55 mm and axis length 65 mm when the axis of the cylinder is (i) vertical (ii) horizontal. [15]
7. Draw the elevation, top view and side view of the object shown in figure. All dimensions are in mm. [15]



8. A hexagonal prism, side of base 30 mm and 65 mm long rests with its base on the ground. The nearest vertical edge is 10 mm to the left of the eye and 15 mm behind the PP. One of the faces containing the edge recedes at  $45^\circ$  to the PP, towards the left. The eye is 150 mm from the picture plane and is at a height of 80 mm. Draw the perspective view of the prism. [15]

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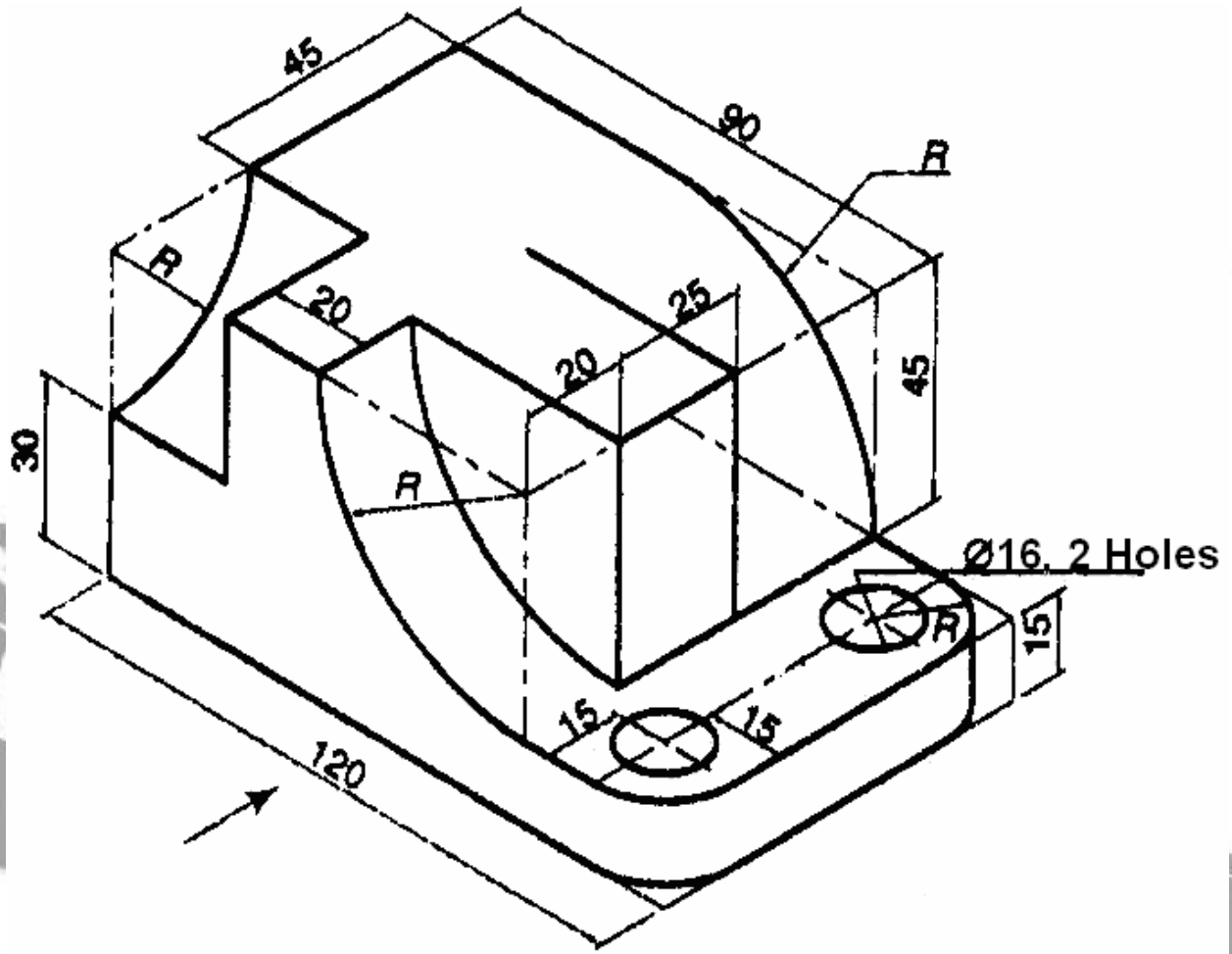
**Time: 3 hours**

**Max. Marks: 75**

**Answer any five questions**  
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1. Draw the path that would be traced by an end of the string, when it is unwound from the circumference of the disc, which is in the form of a square having a 30 mm side surmounted by semicircles on opposite sides. [15]
2. An 80 mm long line PQ, has its end Q both in the H.P. and the V.P. The line is inclined at  $45^{\circ}$  to the H.P. and  $30^{\circ}$  to the V.P. Draw its projections and locate its traces. [15]
3. A hexagonal prism having base with a 30 mm side and 50 mm long axis is resting on its base on the H.P. with a side of base perpendicular to the V.P. A tetrahedron is placed on the top of the prism such that the three corners of the tetrahedron coincide with the alternate corners of the prism. Draw the projections of the arrangement. [15]
4. A hexagonal prism, having a base with a 25 mm side and a 70 mm long axis is resting on a corner of its base in the H.P. and axis inclined at  $60^{\circ}$  to the H.P. and parallel to the V.P. It is cut by a horizontal section plane which divides the prism into two equal halves. Draw its sectional top view. [15]
5. A cylinder of 60 mm diameter having its axis vertical is penetrated by another cylinder of 40 mm diameter. The axis of the penetrating cylinder is parallel to VP and bisects the axis of the vertical cylinder marking an angle of  $60^{\circ}$  with it. Draw the orthographic projections showing the curves of intersection. [15]
6. Draw an isometric view of a hexagonal prism having a base with 25 mm side and a 65 mm long axis, which is lying on its face in the H.P. with axis parallel to both H.P. and V.P. [15]
7. Draw the following views for the object shown in figure. All dimensions are in mm.
  - a) Front view
  - b) Top view
  - c) Left Side view.[15]



8. A rectangular prism of 110 x 70 x 40 mm size is lying on its 110 mm x 70mm rectangular face on the ground plane with a vertical edge touching the PP and the end faces inclined at  $50^\circ$  with the PP. The station point is 80 mm in front of the PP, 65 mm above the ground plane and at 40 mm to the right of the vertical edge that touches the picture plane. Draw the perspective view of the prism. [15]

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