

Code: 9A03101d

1

B.Tech I Year (R09) Regular & Supplementary Examinations, June 2013

ENGINEERING DRAWING

(Common to ME, EIE & IT)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

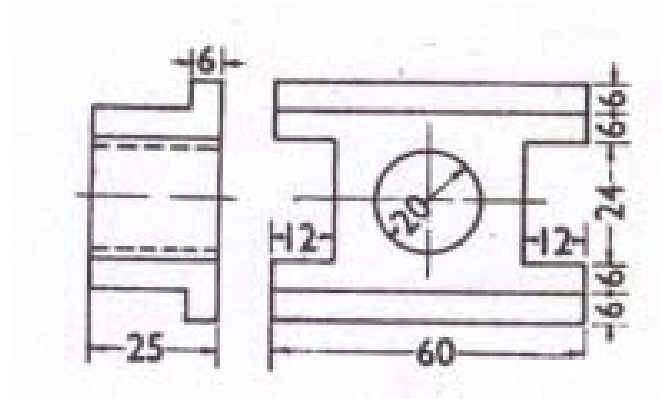
- 1 (a) A circle of 40 mm diameter rolls along a line for one revolution clockwise. Draw a locus of a point on the circle, which is in contact with the line. Also draw a tangent and a normal to the curve at a point 35 mm from the directing line.
(b) Draw an involute of a circle of 30 mm diameter for one complete revolution.
- 2 (a) Draw the projections of a point A lying on HP and 50 mm in front of VP.
(b) Draw the projections of a point A lying on VP and 55 mm above HP.
(c) A point D is 35 mm below HP and 35 mm behind VP. Draw the projections.
(d) A point S is 35 mm above HP and 55mm behind VP. Draw the projections
- 3 (a) A regular hexagonal lamina of 22 mm side rests on one of its sides on HP. It is parallel to and 15 mm away from VP. Draw its projections.
(b) A regular hexagonal plane surface of 25 mm side has two of its edges parallel to both HP and VP and the nearest edge is 1.5 mm from each plane. The surface is inclined at an angle of 60° to HP. Draw the projections.
- 4 (a) Draw the projections of a cube of 30 mm edge, resting in the H.P on one of its corners with a solid diagonal parallel to both H.P and V.P.
(b) A cone of base 50 mm diameter and axis 65 mm long, lies with one of its generators on H.P and its axis parallel to V.P. Draw its projections.
- 5 A pentagonal pyramid, base 30 mm side and axis 75 mm long has its base horizontal and an edge of the base parallel to the V.P it is cut by a section plane, perpendicular to the V.P inclined at 60° to the H.P and bisecting the axis. Draw the front view and the top view when the pyramid is tilted so that it lies on its cut-face on the ground with the axis parallel to the V.P show the shape of the section by dotted lines. Develop the surface of the truncated pyramid.

Contd. in Page 2

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1

- 6 Two views of a casting are shown below. Draw the isometric view of the casting (dimensions are in mm)



- 7 A cylinder of 60 mm diameter stands vertically on its base. It is pierced by a horizontal square prism of 35 mm side of base such that the axes of the two solids intersect each other at right angles. A face of the prism is inclined at an angle of 60° to HP and 30° to VP. Draw the projections of the solids, showing the lines of intersection.
- 8 The frustum of a square pyramid with a 50 mm base edge, 25 mm top edge and 40 mm height rests on its base in the GP with an edge of the base inclined at 30° to the PP and axis 40 mm behind it. The station point is 70 mm above the GP and 60 mm in front of the PP and lies in a CP which is 40 mm towards the right of the axis. Draw its perspective projection.

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2

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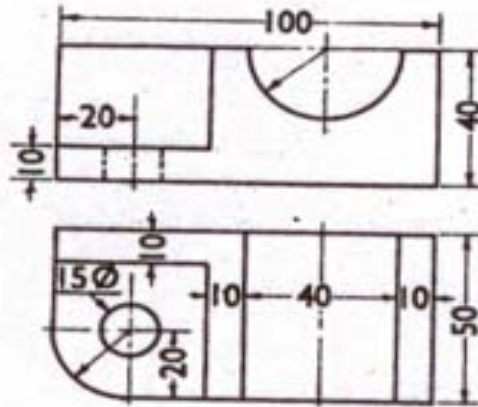
- 1 (a) Draw the involute of a circle 40 mm diameter. Draw a tangent and normal to the curve at a point 95 mm from the center of the circle.
(b) Draw the involute of a regular hexagon of side 25 mm. Draw a tangent and normal to the curve at a distance of 100 mm from the center of the hexagon.
- 2 (a) A point M is 35 mm above HP and 40 mm in front of VP. Draw its projections.
(b) A point B is 45 mm above HP and 60 mm behind VP. Draw the projections.
(c) Draw the projections of a point B lying on HP and 55 mm in front of VP.
(d) A point M is 60 mm below HP and 45 mm in front of VP. Draw the projections.
- 3 (a) A triangular lamina of 50 mm side, is standing on one of its sides, which is inclined 45° to VP and surface of the lamina is making an angle of 30° to HP. Draw its projections.
(b) A regular pentagonal plate of side 28 mm is placed with one side on HP such that the surface is inclined at 45° to HP and perpendicular to VP. Draw its projections.
- 4 (a) A square prism side of base 30 mm and axis 50 mm long, has an edge of its base in H.P. Its axis is inclined at 60° to H.P. and parallel to V.P. Draw its projections.
(b) A square prism side of base 40 mm and axis 60 mm long, rests with one of its base corners on H.P. its base makes an angle of 45° to H.P. and its axis is parallel to V.P. Draw its projections.
- 5 A tetrahedron of 65 mm long edges is lying on the H.P. on one of its faces, with an edge perpendicular to the V.P. it is cut by a section plane which is perpendicular to the V.P. so that the true shape of the section is an isosceles triangle of base 50 mm long and altitude 40 mm. Find the inclination of the section plane with the H.P. and draw the front view, sectional top view and the true shape of the section.

Contd. in Page 2

Code: 9A03101d

2

- 6 Two views of a casting are shown below. Draw the isometric view of the casting (dimensions are in mm)



- 7 A square prism, having base with a 50 mm side, is resting on its base on H.P with the faces equally inclined to the V.P. It is completely penetrated by a horizontal cylinder with a 50 mm base diameter such that their axes bisect each other at right angles. Assuming suitable lengths of both the solids draw their projections and show the curves of intersection.
- 8 The frustum of a hexagonal pyramid with a 40 mm base edge, 20 mm top edge and 40 mm long axis, rests on the GP with an edge of the base parallel to and 10 mm behind the PP. The station point is 40 mm above the ground and at a distance of 70 mm in front of the PP and 50 mm towards the right of the axis of the pyramid. Draw its perspective projection.

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3

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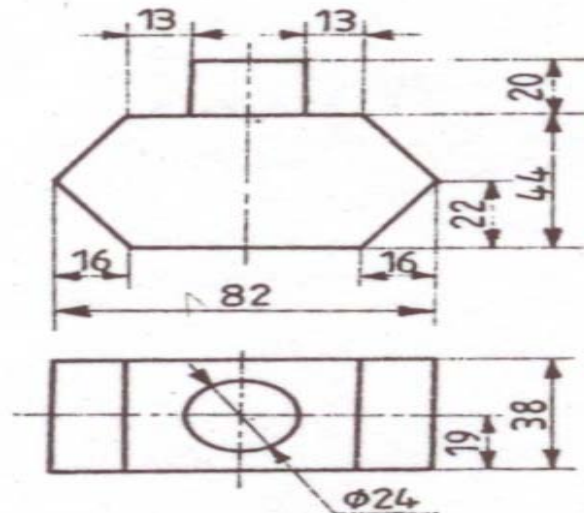
- 1 (a) Divide a given line 125 mm in 9 equal parts.
(b) Inscribe a pentagon in a circle of 50 mm diameter.
(c) Construct an ellipse, with distance of the focus from the directrix as 50 mm and eccentricity as $2/3$. Also draw normal and tangent to the curve at a point 40 mm from the directrix.
- 2 (a) A line AB of 100 mm length is inclined at an angle of 30° to HP and 45° to VP. The point A is 15 mm above HP and 20 mm in front of VP. Draw the (i) Front view. (ii) Top view
(b) A line AB of 100 mm length is inclined at 30° to HP and 45° to VP. The point A is 15 mm above HP and 20 mm in front of VP. Draw the projections of the line.
- 3 (a) A square ABCD of 50 mm side has its corners A in H.P its diagonal AC is inclined at 30° to H.P and the diagonal BD is inclined at 45° to V.P and parallel to H.P. Draw its projections.
(b) A thin 30° - 60° set square has its longest edge in V.P and inclined at 30° to H.P. Its surface makes an angle of 45° with V.P. Draw its projections.
- 4 (a) A hexagonal pyramid, side of base 25 mm and axis 50 mm long, rests with one of the edges of its base on H.P and its axis is inclined at 30° to H.P and parallel to V.P. Draw its projections.
(b) A pentagonal prism side of base 25 mm and axis 50 mm long rests with one of its shorter edges on H.P such that the base containing that edge makes an angle a 30° to H.P. and its axis is parallel to V.P. Draw its projections.
- 5 A hexagonal pyramid of side of base 24 mm and height 56 mm is resting on its base in the HP with one of the sides of the base parallel to VP. It is cut by a plane normal to VP and inclined at 30° to HP and passing through a point P at 16 mm from the apex on the axis. It is also cut by an another plane perpendicular to VP and passing through the same point P and perpendicular to previous section plane. The portion containing the apex removed. Draw the sectional top view and the development of the lateral surface of the remaining solid such that the developed surface is symmetrical.

Contd. in Page 2

Code: 9A03101d

3

- 6 Two views of a casting are shown below. Draw the isometric view of the casting (dimensions are in mm)



- 7 A square prism, having base with a 60 mm side and a 100 mm long axis, is resting on its base on H.P with the faces equally inclined to the V.P. It is completely penetrated by a hexagonal prism having base with a 30 mm side and a 100 mm long axis having a face parallel to H.P. The axes of the prisms bisect each other at right angles. Draw their projections and show the curves of intersection.
- 8 Draw the perspective projection of a cube of side 55 mm resting on the ground plane on its base with all the vertical faces equally inclined to the picture plane. One vertical edge is touching the picture plane and is 15 mm to the left of the station point which is 60 mm above the ground and 50 mm in front of the picture plane.

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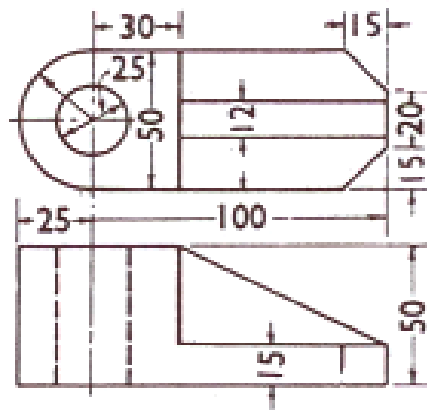
- 1 (a) To construct a pentagon length of a side is 30 mm.
(b) To draw an arc passing through three points not in straight line.
(c) Construct a parabola, with the distance of the focus from the directrix as 50 mm, also draw normal and tangent to the curve at a point 40 mm from the directrix.
- 2 (a) Draw the projections of a line CD 30 mm long, parallel to HP and inclined to VP. The end C is 10 mm in front of VP and D is 20 mm in front of VP. The line is 15 mm above HP. Also find the traces.
(b) A line RS 40 mm long is parallel to both planes. It is 20 mm above HP and 15 mm in front of VP. Draw projections and its traces.
- 3 (a) A square lamina of 50 mm side is inclined at 45° to V.P and parallel to H.P. Draw its projections.
(b) An equilateral triangle lamina of side 30 mm parallel to H.P and to V.P. One of its side is 20 mm in front of V.P and 30 mm above H.P. Draw its projections.
- 4 (a) Pentagonal prism base 30 mm side and axis 60 mm long has an edge of its base in H.P. Axis is inclined at 45° to ground and parallel to V.P. Draw the projections.
(b) Draw the projection of a cone, base 75 mm diameter and axis 100 mm long lying on H.P with its axis parallel to V.P and inclined at 30° to H.P.
- 5 A pentagonal prism, side of base 45 mm and height 130 mm, is kept on the ground on its base with one of the vertical faces which is away from the observer parallel to VP. A circular hole of diameter 74 mm is cut through it, so that the axis of the hole is bisecting the axis of the prism and it is parallel to HP and VP. Draw the development of the lateral surface of the prism.

Contd. in Page 2

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4

- 6 Two views of a casting are shown below. Draw the isometric view of the casting (dimensions are in mm)



- 7 A square prism, having base with a 60 mm side and 100 mm long axis, is resting on its base on the H.P with a face inclined at 30° to the V.P. It is penetrated by a horizontal square prism having base with a 45 mm side and a 100 mm long axis. The axis of the penetrating prism is 15 mm away from that of the former and a face inclined at 30° to the H.P. Draw three views of the combination and show lines of intersection.
- 8 Draw a perspective view with a square plane with a 40 mm side which stands vertically on the GP with an edge parallel to and 10 mm behind the PP. The surface of the plane is inclined at 30° to PP. The station point is 50 mm in front of PP, 55 mm above GP and lies in a CP high is 50 mm towards right of the centre of the plane.
