JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
I B.TECH – REGULAR EXAMINATIONS JUNE - 2010
ENGINEERING DRAWING
(COMMON TO ME, CHEM, MMT, ICE)

Time: 3hours   Max.Marks:75

Answer any FIVE questions
All questions carry equal marks
- - -

1.a) Construct a forward reading Vernier scale to read distance correct to a decameter on a map in which the actual distances are reduced in the ratio of 1 : 40000. The scale should be long enough to measure upto 6 km. Mark on the scale lengths of 3.34 km and 0.59 km.

  b) The ordinate of a point P on the curve is 40 mm and is at a distance of 20 mm from the vertex. Draw the parabola.   [8+7]

2. The HT and the VT of a straight line coincides with each other and 20 mm away from one of the ends as measured parallel to XY. The distance between the end projectors of the line measured parallel to XY is 50 mm. Draw the projections. Find the TL and the true inclinations of the line. The end nearer to the HT and the VT is 15 mm from the VP and 25 mm from the HP.   [15]

3. A square lamina is placed such that one of the corners is touching the VP and the diagonal through this is perpendicular to the VP and measures 60mm. The other diagonal appear to be 40 mm in the view from above. Draw the projections and find the inclination of the plane to the ground.   [15]

4. A pentagonal prism of base edge 30 mm and height 70 mm is placed with one of its rectangular faces on the ground and the axis parallel to the VP. It is cut by a section plane perpendicular to the VP and inclined at 30^0 to the ground. It passes through the mid point of the axis. Develop the remaining surface of the object.
                                                                        [15]

5. Two cylinders of base diameter 60mm penetrate each other. One cylinder is placed vertically and another horizontally. The axes of the two objects are 30mm apart. Draw the curves of intersection.   [15]

6. An equilateral triangular prism of base edge 40mm and height 70mm is resting on one of the corners on the ground. The rectangular face opposite to the corner on the ground is perpendicular to the VP and inclined at 30^0 to the ground. Draw the isometric projection of the object.   [15]

7. Draw top, front and side views of the isometric projection given in figure. All dimensions are in mm. [15]

8. A pentagonal prism of side of base 30mm, axis 60mm long rests on one of its rectangular faces on the ground with a pentagonal face touching the PP. The point of sight is 60mm to the right of the axis of the prism, 70mm from the PP and 80 mm above the ground. Draw the perspective view of the prism. [15]

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1.a) A small length of 1 mm is to be enlarged to 20 times and a diagonal scale is to be constructed to represent this such that the LC is 0.01 mm. Construct this scale and mark on it a distance of 0.73 mm and 0.29 mm. What is the RF of this scale?

b) A circle of 50 mm diameter rolls on a horizontal line for half a revolution. For the remaining half revolution it rolls on a line perpendicular to the first. Draw the curve traced by a point on the circumference of the circle.   [8+7]

2.   The HT and the VT of a straight line AB is below and above XY respectively. The distance between the HT and the VT as measured parallel to XY is 200mm. The end B of the line is nearer to the VP than the end A. The view from above of the line makes 30^0 to XY. The end B is 10 mm from the VP and 20 mm from the HP. The distance between the end projectors of the line measures 50mm parallel to XY. Draw the projections of the line.   [15]

3.   A cone of base 60 mm diameter and height 80mm has the mid point of the axis 60 mm away from both the planes. The axis is inclined at 30^0 to the VP and 60^0 to the ground. Draw the projections of the cone.   [15]

4.   Two faces of a prism are equilateral triangles of sides 40mm long. The remaining three faces of the prism are squares of 40 mm sides. The object is cut by two section planes such that the view from the front gives an impression of a square pyramid. Draw the development of the surface of the object after it is being cut.
                                                                               [15]

5.   A horizontal cone of base diameter 80mm and height 90mm penetrates a vertical cylinder of base diameter 60mm. The axes intersect each other and the axis of the cone is 60^0 to the VP. The apex of the cone is towards the VP. Draw the views with the curves of interpenetration.   [15]

6.   An equilateral triangular pyramid of base edge 40mm and height 60mm is resting on its base on the ground with one of the base edges being perpendicular to the VP. It is cut by a section plane parallel to 15mm from triangular face containing the base edge which is perpendicular to the VP. Draw the isometric projection of the object.   [15]

7. Draw top, front and side views of the isometric projection given in figure. All dimensions are in mm. [15]
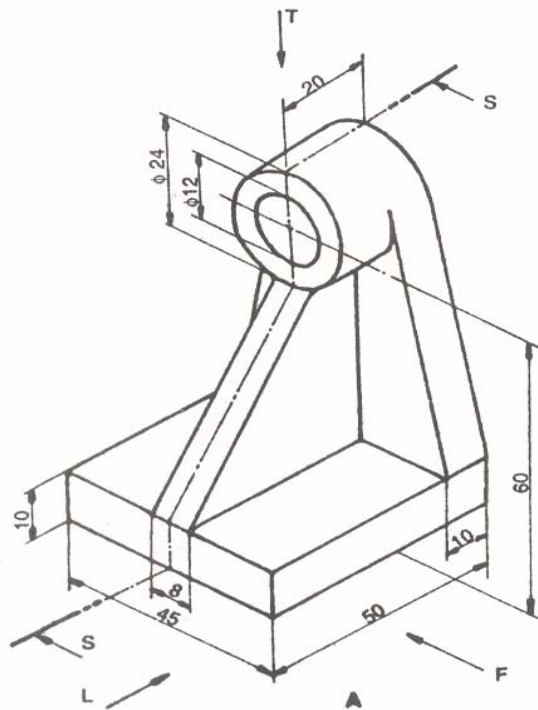
8. A square prism of base edge 50mm by 70mm long is resting on one of its longer edges on the ground, this edge being perpendicular to the PP. The rectangular faces containing this edge make equal inclinations with the ground. The base of the prism touches the PP. The station point is 70mm to the right of the axis, 60mm from the PP and 60mm above the ground. Draw the perspective projection of the object. [15]

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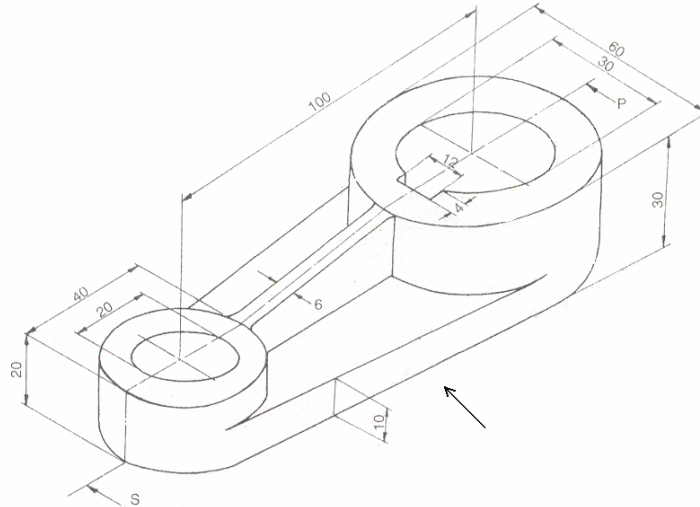**ENGINEERING DRAWING**
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1.a) A line of length 100 mm is divided into 10 equal parts and each part represents a main scale division. With the help of a diagonal scale obtain a LC of 0.2 mm and mark on it a length of:
a)   41.6 mm
b)   53.8 mm and
c)   67.4 mm

   b) Draw the locus of a point on the circumference of a circle of radius 20 mm which rolls on a straight line for one and half revolutions of the circle. Take the initial position of the point to be diametrically opposite to the straight line.   [8+7]

2.   A room has the dimensions 6m × 4m × 3m. Two nails are driven on two adjacent walls at heights of 2.5m and 1.5m from the ground respectively. One nail is 3m away and another is 2m away from the common edge of the walls. Find graphically the minimum length of the thread required to connect the nails. What is the inclination of the thread to the ground and to the wall?   [15]

3.   A tetrahedron of edge 50 mm long is standing on one of its corners on the ground with one of the edges connected with this corner making 60^0 with the ground and one of the triangular faces connected with this corner making an angle of 30^0 with the VP. Draw the projection of the object.   [15]

4.   A hexagonal prism of base edge 20 mm and 60 mm long is standing on its longer edge on the HP and the edge on the HP is parallel to the VP. It is cut by a section plane perpendicular to the VP and inclined at 60^0 to the HP. The section plane passes through the axis at a point 20 mm from its base. Draw the development of the surface of the sectioned object.   [15]

5.   A cone of base diameter 60mm and height 80mm stands on its base on the ground. A horizontal square prism of base edge 30mm with two of its adjacent base edges being equally inclined to the ground penetrates the cone. The two axes bisect each other, at right angles to each other and both parallel to the VP. Draw the projections of the objects showing the curves of interpenetration.   [15]

6.   A sphere of 60mm diameter is intersected by a cylinder of 30mm diameter. The axis of the cylinder passes through the centre of the sphere. The tip of the axis of the cylinder is 70mm from the centre of the sphere. Draw the isometric projection of the objects when the axis of the cylinder is parallel to both the VP and the HP.

                                                                                                        [15]

7. Draw top, front and side views of the isometric projection given in figure. All dimensions are in mm. [15]

8. A square pyramid of base edges 50mm long and altitude 70mm is resting on its base on the ground with one of the corners of the base touching the PP. Two adjacent base edges having this corner makes equal inclination with the VP. The station point lies on the central line of the object 60mm in front of the PP and 90mm above the ground. Draw the perspective projection of the object. [15]

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1.a) An isosceles triangle ABC is lying on the edge BC on the ground and the plane of the triangle is perpendicular to the ground. AC=BC=90mm, AB = 68 mm. If the length CB represents 90^0 on a scale of chords, construct the full scale representing all angles from 0 to 90^0 at an interval of 10^0. Using this, set off an angle of 130^0.

b) Construct a cycloid whose length is equal to 200 mm. Draw a tangent and normal to the curve at any suitable point on it.   [8+7]

2. A room is 8m×5m×4m. A peg is driven at the centre of the roof. Another peg is driven on a common edge between the two mutually perpendicular walls. The minimum length of the thread connecting these two pegs is 5.5 m. Find the height of the peg on the common edge above the ground.   [15]

3. A frustrum of a cone has a base dia of 60 mm and top dia of 40mm. The height of the object is 40mm. A through square hole is centrally made (25 mm side) along the axis. Any two edges of the hole starting from the same corner make equal inclination to the HP. The axis is 30^0 to the VP and parallel to the HP. Draw the projections of the solid.   [15]

4. The development of a lateral surface of a cylinder is a rectangle 220 mm by 60mm. The height of the cylinder is greater than the base. Draw the development of the lateral surface of this cylinder when it is cut by a section plane bisecting the axis and at an angle of 30^0 to the base of the cylinder.   [15]

5. A cone of base diameter 60mm and height 80mm stands on its base on the ground. Hexagonal prism (base edge 15mm) with two opposite faces perpendicular to the ground penetrates the cone. The axes of the objects are 10mm away from each other and the axis of the cone is nearer to the VP. Both the axes are parallel to the VP. The axis of the prism is parallel to the HP. Draw the view from above and the view from the front and show the curves of interpenetrations.
         [15]

6. A square prism of base edge 50mm and height 60mm is resting on its base on the ground with one of the base edges parallel to the VP. A square hole 30mm × 30mm is made through the prism. The axis of the hole and that of the prism bisect each other at right angles to each other. Two adjacent short edges of the hole are equally inclined to the ground. Draw the isometric projection of the object. [15]

7. Draw top, front and side views of the isometric projection given in figure. All dimensions are in mm. [15]

8. A rectangular prism of base edges 60mm × 40mm and height 80mm is resting on its broader rectangular face on the ground with the base parallel to the PP. The PP bisects the axis of the object. The station point is on the central line of the object 80mm in front of the PP and 70mm above the ground. Draw the perspective projection of the object. [15]

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