

**GUJARAT TECHNOLOGICAL UNIVERSITY**

B.E. Sem-I Examination January 2010

Subject code: 110013

Subject Name: Engineering Graphics

Date: 13 / 01 / 2010

Time: 11.00 am – 2.00 pm

Total Marks: 70

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary and state them.
3. Figures to the right indicate full marks.
4. All dimensions shown in the figures are in mm.
5. Retain all construction lines and show the required dimensions.
6. Take suitable scale whenever required and mention it clearly.
7. Figure drawn in the question paper is not to the scale.

- Q.1** Draw the front view, top view and left hand side view of the object given in **figure 1**. Use first angle projection method. **14**

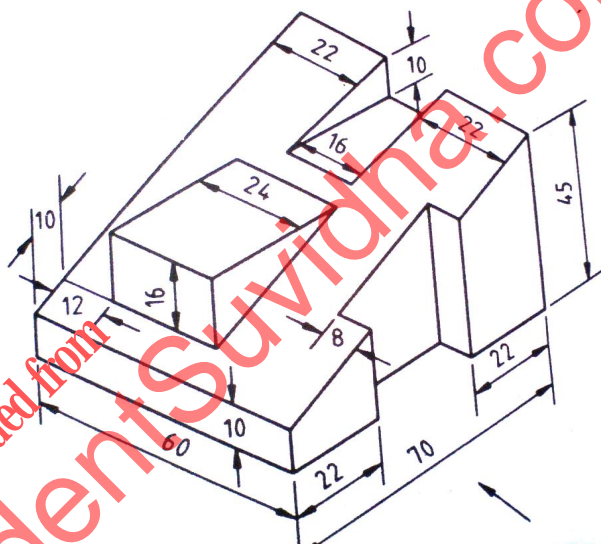


Figure 1

- Q.2** (a) An athlete was asked to slide down a rope tied to a beam at a height of 8 meters above the ground. He takes 5 seconds to slide down with uniform velocity. The rope oscillates in a vertical plane, through an angle of  $20^\circ$  on either side of the plumb line and takes 5 seconds for one complete oscillation. Draw the path traced out by the athlete (assumed as a point). Use convenient scale. **07**
- (b) Draw an involute of a circular arc which subtends an angle of  $90^\circ$  at the centre of the circle of diameter 120 mm. **07**

**OR**

- (b) Draw an involute of a line of 10 mm for 5 turns. **07**

- Q.3** An isosceles triangular plate ABC has its base 45 mm and altitude 60 mm. It is so placed that the front view is seen as an equilateral triangle of 45 mm side and (i) base is inclined at  $45^\circ$  to HP, (ii) side is inclined at  $45^\circ$  to HP. Draw its plan when its corner A is on HP. **14**

**OR**

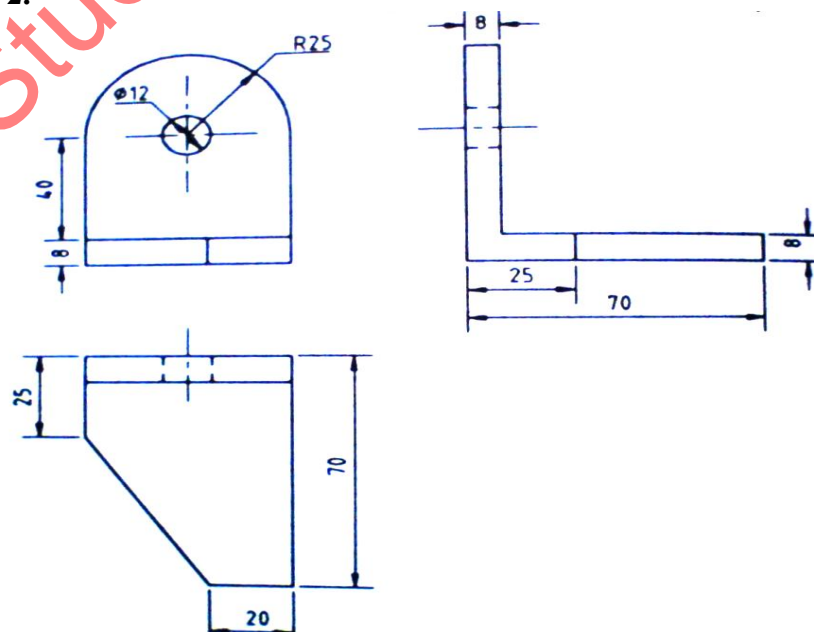
- Q.3** A square pyramid, side of base 50 mm and height 64 mm, is freely suspended from one of the corners of the base. Draw its projection when vertical plane containing the axis makes an angle of  $45^\circ$  to VP. **14**
- Q.4 (a)** A tetrahedron of 50 mm long edges is lying on HP on one of its faces with one of its edges perpendicular to VP so that the true shape of its section is an isosceles triangle of base 40 mm and altitude 28 mm. Find the inclination of the section plane with HP. Draw the front view, sectional top view and the true shape of the section. **07**
- (b)** A right regular pentagonal prism, edge of base 20 mm and height 50 mm rests on its base with one of its base edges perpendicular to VP. An AIP inclined to HP at  $30^\circ$  and perpendicular to the VP cuts its axis at a distance of 30 mm from the base. Develop the lateral surface of the truncated prism. **07**

**OR**

- Q.4 (a)** A solid made of half cone, diameter of base 60 mm, and half hexagonal pyramid, side of base 30 mm, is having 60 mm height. It is resting on HP on its base with middle edge of base perpendicular to VP. It is cut by an AIP inclined at  $30^\circ$  to HP, passing through a point on axis 12 mm above the base. Draw elevation, plan and true shape of the section. **07**
- (b)** A right circular cone, diameter of base 55 mm and height 80 mm rests on ground on its base. A bee starts from right hand of its base rim and moves around the surface of the cone and finally comes back to the starting point. Find the length of the shortest path the bee should take in covering the distance along the surface of the cone. Also show the path in front and top views. **07**
- Q.5 (a)** Draw the isometric projection and isometric drawing of a sphere of diameter 50 mm placed on a cylinder of base 60 mm diameter and height 30 mm. **07**
- (b)** A line AB, 80 mm long is inclined at  $45^\circ$  to HP and  $30^\circ$  to VP. Its midpoint C is in VP and 15 mm above HP. The end A is in the third quadrant and B in the first quadrant. Draw the projections of the line. **07**

**OR**

- Q.5 (a)** A line PQ, 70 mm long has its end P in VP and end Q in HP. Line is inclined to HP by  $60^\circ$  and VP by  $30^\circ$ . Draw the projections. **07**
- (b)** Draw the isometric view for the orthographic projection given below in figure 2. **07**



**Figure 2 (for Q.5 (b))**

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