

## ENGINEERING GRAPHICS

Time : 3 hours

Full Marks : 70

Instructions :

- (i) All questions carry equal marks.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt any **FIVE** questions.
- (iv) Question No. 1 is compulsory.

1. Answer the following questions (any seven) :

- (a) Write down two major differences between orthographic projections and isometric projections.
- (b) A straight line is inclined with both HP and VP.  $\theta + \phi = 90^\circ$ . What is the commonality between front view and top view?
- (c) Why do you not use second and fourth angles of projections (show at least two reasons)?
- (d) Describe the functions of the following AutoCAD commands :
  - (i) ISOPLANE
  - (ii) TRIM
- (e) What is the nature of lateral surface of a cylinder?

- (f) A sphere in isometric projection appears as a circle. What is the value of diameter of the circle?
- (g) A 90 mm long line  $PQ$ , inclined at  $30^\circ$  to the HP and  $45^\circ$  to the VP, has the end  $P$  15 mm above HP and 25 mm in front of VP. In which angle, the other end will lie?
- (h) A tetrahedron is resting on its face on the HP with a side perpendicular to the VP. What will be its front view?
- (i) A triangular prism is resting on a rectangular face in the HP. It is cut by a horizontal plane. What will be the shape of the sectional top view?
- (j) A vertical cylinder is penetrated by a horizontal cylinder. What will be the top view of the curve of intersection?

- 2. A link 150 mm long swings on a pivot from its vertical position of rest to the right, through an angle of  $35^\circ$ . After its swing to the left through an angle of  $70^\circ$ , it returns to its initial position. During this period, a fly travels from top to bottom of the link at a uniform speed along the centre line of the link. Trace the path of the fly.
- 3. A line  $AB$ , 100 mm long, is inclined at  $50^\circ$  to HP. The end  $A$  is 10 mm above the HP and end  $B$  is 65 mm in front of the VP. Draw the projections of the line if its FV measures 90 mm. Locate traces and the inclination of the line with the VP.

4. A pentagonal prism of base side 30 mm and axis length 60 mm is resting on HP on one of its base corners with its axis inclined at  $40^\circ$  to HP and parallel to VP. Draw its projections when the base sides containing the resting corner are equally inclined to HP.
5. A pentagonal prism with a 25 mm base-side and 70 mm height is resting on its base on the HP with a side of base inclined at  $40^\circ$  to the VP. An AIP inclined at  $65^\circ$  to the HP and passing through the midpoint of the axis cuts the prism. Draw the front view, sectional top view, sectional side view and the true shape of the section.
6. Hexagonal prism of base side 30 mm and axis length 60 mm is resting on HP on its base with two of its vertical faces perpendicular to VP. It is cut by a plane inclined at  $50^\circ$  to HP and perpendicular to VP and meets the axis of prism at a distance 10 mm from the top end. Draw the development of the lateral surface of the prism.
7. A vertical square prism of base side 35 mm is penetrated by a horizontal square prism of base side 20 mm. The axis of the horizontal prism is 5 mm in front of the vertical prism axis and is parallel to VP. Draw the projections of the prisms showing the lines of intersection when the faces of the prism are equally inclined to VP.

8. Draw the front view, top view and left-hand side view of the following object (Fig. 1).

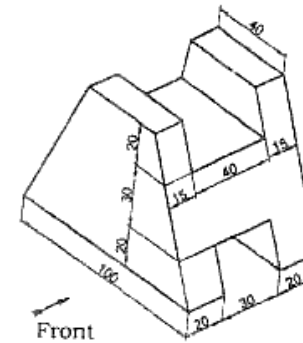


Fig. 1

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9. Draw the isometric view from the following orthographic views (Fig. 2).

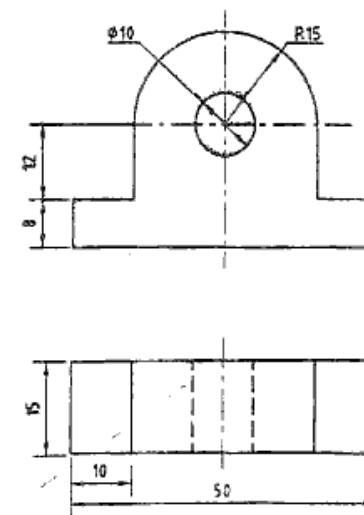


Fig. 2

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