R15

Time: 3 hours **Max Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) Construct a plain scale of RF=1/40 to read meters and decimeters. Maximum length to be measured using it is 5 meters. Mark on it a distance of 3.4 m.

 b) Draw an involute of a circle of 50 mm diameter. Also draw a normal and a tangent at a point distant 100 mm from the centre of the circle. [7+8]

OR

2.a) The distance between two places is 240 km and its equivalent distance on map measures 12cm. Draw a diagonal scale to indicate 273 km and 128 km.

 b) A point moves such that the sum of its distances from two fixed points 100 mm apart is always constant and is equal to 140 mm. Draw the locus of the point, the tangent and normal to the curve at any point on it. [7+8]

3.a) A point A is in the HP and 25 mm in front of VP. Another point B is also in HP and behind VP. The distance between their end projectors is 55mm. Draw its Projections when the line joining their plans makes an angle of 50^0 with reference Line. Also find the distance of the point B from the VP.

 b) A line AB is 85mm long has its end A 25mm away from both the reference planes and is in the first quadrant. The line is inclined at 50^0 to HP and 30^0 to VP. Draw its projections and mark the traces of the line. [8+7]

OR

4.a) A line AB is 80 mm long and it has end 20 mm above HP and 25 mm in front of VP. The line is inclined at 45^0 to HP and 35^0 to VP. Draw its projections.

 b) A straight line PQ has its end P 20 mm above the H.P and 30 mm in front of the V.P and the end Q is 80 mm above the H.P and 70 mm in front of V.P. If the end projectors are 60 mm apart, draw the projections of the line. Determine its true length and true inclinations with the reference planes. [7+8]

5. A hexagonal pyramid, base 25 mm side and axis 55 mm long, has one of its slant edges on the ground. A plane containing that edge and the axis is perpendicular to the H.P. and inclined at 45^0 to the V.P. Draw its projections when the apex is nearer the V.P. than the base. [15]

OR

6. A square prism, base side 40 mm, axis 80 mm long has its base on the H.P. and its faces equally inclined to the V.P. It is cut by a plane, perpendicular to the V.P. inclined at 60^0 to the H.P. and passing through a point on the axis, 55 mm above the H.P. Draw its front view, sectional top view and another top view on an A.I.P. parallel to the section plane. [15]

7. A cylinder of base diameter 50 mm and axis length 60 mm is resting on HP on its base, cut by a plane inclined at 55^0 to HP and perpendicular to VP. The cutting plane is passing through a point on the axis at a distance 30mm from the top end. Draw the development of the lateral surface of the remaining portion of the cylinder. [15]
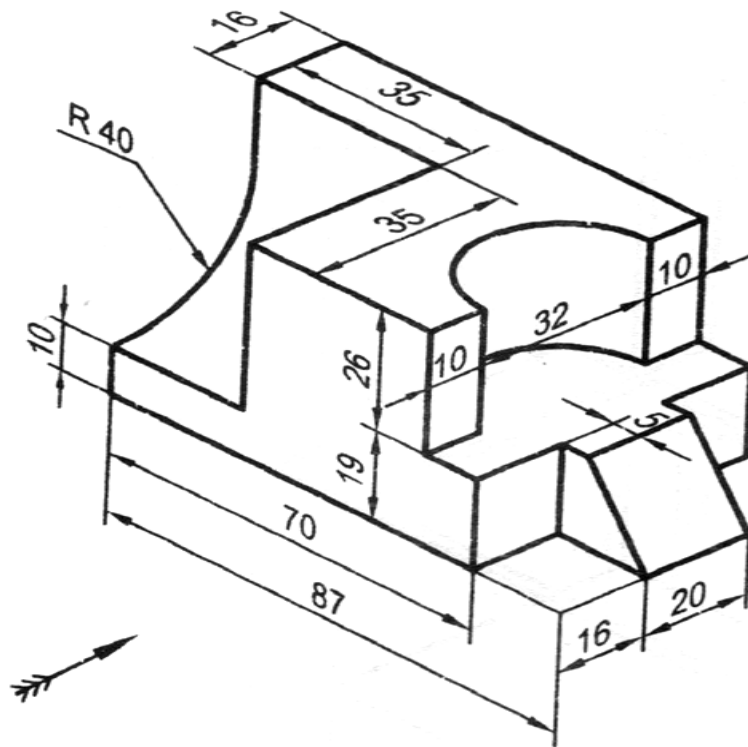
OR

8. A cylinder of 50 mm diameter stands vertically with its base on HP. It is completely penetrated by an cylinder of 50 mm diameter. The axis of the penetrating cylinder is parallel to VP, inclined at 30^0 to HP and bisects the axis of the vertical cylinder. Draw the curves of intersection. [15]

9. A sphere of radius 20 mm is kept on the top face of a square prism of side of base 40 mm and height 20 mm. The latter is placed on the top face of a cylinder of 65 mm diameter and 25 mm height. All the three solids have the common axis. Draw the isometric projection of combination of solids. [15]

OR

10. Draw the front view, top view and left-side view of the object given in figure. All dimensions are in mm. [15]

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