

Time: 3 hours

Max Marks: 75

R15

Answer any five questions All questions carry equal marks

1. A wheel of 49 mm diameter rolls downward on the vertical wall by ½ a revolution and then on the floor by ½ a revolution without slipping. Draw the locus of point P on the circumference of the wheel. Take initial position of the point P at the contact point of the wheel with the wall. [15]

OR

- 2.a) A rectangular map 200 cm \times 125 cm wide represents an area of 62500 square meters. What is R.F. of the map? Construct a diagonal scale to measure kilometer, hectometer and decameter. Show on scale a distance of 5 kilometres, 4 hectometres and 8 decametres.
- b) Construct a vernier scale to read centimeters and long enough to measure up to 5m. Take R.F. = $\frac{1}{25}$. Mark on it a distance 2.42m. [7+8]
- 3. The top view and the front view, of the line CD, measure 65mm and 53mm respectively. The line is inclined to H.P. and to V.P. by 30⁰ and 45⁰ respectively. The end C is on the H.P. and 12mm in front of V.P. Other end D is in the 1st quadrant. Draw the projections of the line CD and find its true length and draw traces. [15]

OR

4. A regular pentagon ABCDE, of 30 mm sides, has its side AB in the V.P. and inclined at an angle of 30^{0} to the H.P. The corner A is 15mm above H.P. and the corner D is 20 mm in front of V.P. Draw the projections of the plane and find its inclination with the V.P.

[15]

5. A square prism, edge/side of base 30 mm and height 45 mm, is resting on H.P. on one of the edges of the base. The edge on which it rests on H.P. makes 45⁰ with V.P. The base of the prism makes 30⁰ with H.P. or the axis of the prism makes 60⁰ with H.P. or rectangular face, containing the edge on which it rests on H.P., makes 60⁰ with H.P. Draw the projections of the prism, when a) base is away from the observer or nearer to V.P, b) base is nearer to observer or away from V.P. [7+8]

OR

- 6. A cylinder, diameter of base 43 mm and height 58 mm is resting on H.P. on its base. It is cut by A.I.P. in such a way that the true shape of section is an ellipse with major axis 60mm and minor axis 43 mm. Find the inclination of A.I.P. with H.P. and draw three projections.
 [15]
- 7. A pentagonal pyramid, side of base 35 mm and height 60 mm, is resting on H.P. on one of its triangular faces. It is cut by A.V.P. inclined to V.P. by 30⁰ bisecting the axis. Draw sectional elevation, true shape of section and draw the development of lateral surfaces of the pentagonal pyramid. Assume axis of the pyramid parallel to V.P. [15]

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- 8. A cylinder, of 80 mm diameter, is resting on H.P. on its base. A cone, diameter of base 90mm and height 110 mm, penetrates the cylinder at right angle. The axis of the cone is parallel to H.P. and V.P. both. Apex of the cone reaches 60 mm beyond the axis of the cylinder. Draw projections showing the lines of intersection. [15]
- 9. From Figure 1, draw a) Front view b) R.H.S.V. side view c) Top plan. Use the first angle projection system. All dimensions are in mm. [15]



10. From given Front view and Top view, draw Isometric view of the given figure 2. All dimensions are in mm. [15]



