Q.1  Objective Question (MCQ)

(a) A short break line is used to indicate a
   (a) Broken part (b) part to be broken (c) long part of uniform cross
   section (d) short part of non-uniform cross section

(b) The type of line used to indicate a cutting plane is
   (a) Dashed (b) long dashed dotted (c) long dashed double dotted
   (d) continuous freehand

(c) The size of the drawing drawn to scale 2:1 will be ____________ the
   actual size.
   (a) Same as (b) twice of (c) half of (d) none of a,b, and c

(d) If an area of $Y^2$ is represented by an area of $X^2$ on a drawing, then the
   RF is equal to
   (a) $X/Y$ (b) $X^2/Y^2$ (c) $\sqrt{X} / \sqrt{Y}$ (d) $\sqrt{X^2} / \sqrt{Y^2}$

(e) Boyle’s law, $PV = \text{constant}$ generates a curve which is a
   (a) Hyperbola (b) rectangular hyperbola (c) parabola (d) rectangular
   parabola

(f) The gear tooth profile is in the form of
   (a) parabola (b) involute (c) spiral (d) helix

(g) The line joining any point on an Archimedean spiral with the pole is
   called the
   (a) shortest radius (b) radius vector (c) vectorial angle (d) convolution

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7. In Isometric projection, the length or width of the object is drawn at ________ to the horizontal reference line.
   (a) 30° (b) 45° (c) 90° (d) 120°

Q.2 (a) Define the following curves.
   (1) Involute
   (2) Hyperbola
(b) Construct an Ellipse by rectangle method, given the major and minor axes as 65 mm and 40 mm respectively.
(c) A line AB, 60 mm long, is inclined to H.P. at 35° and also inclined to V.P. at 45°. The end A of the line is 20 mm above H.P. and 15 mm in front of V.P. The end B is in third quadrant. Draw the projections of line AB.

Q.3 (a) Define the following curves.
   (1) Archimedean Spiral
   (2) Ellipse
(b) Construct a parabola with distance between focus and directrix is 40 mm.
(c) A pentagonal prism of 30 mm sides and 60 mm height is resting on one of its corners of its base on H.P. such that the axis is inclined at 45° to H.P. Draw the projection of the prism. Now, the prism is cut by a sectional plane inclined at 60° to V.P. and bisecting the axis. Draw the sectional front view of the prism.

Q.4 (a) Differentiate between Epitrochoid and Hypotrochoid.
(b) Construct an Involute of a regular pentagon of 25 mm sides.
(c) The end projectors of a line PQ are 35 mm apart. The end P of the line is 10 mm above H.P. and 15 mm in front of V.P. The front view and top view of the line measure 50 mm and 60 mm respectively. Draw the projection of the line assuming end Q is in first quadrant. Also find the true length and true inclinations of the line with H.P. and V.P.

Q.5 (a) Give complete classification of solids.
(b) The frustum of a cone of 30 mm base diameter, 50 mm top diameter and 50 mm height is resting on V.P. on a point of its base circumference such that the axis is inclined at 50° to V.P. and parallel to H.P. Draw the projections of the solid.
(c) A regular hexagonal plate of 30 mm sides is resting on one of its edges on V.P. such that the surface is inclined at 45° to V.P. and the edge on which it is resting is inclined at 30° to H.P. Draw the projections of the hexagonal surface.

Q.6 (a) Draw F.V. and T.V. of the following points on a common XY line.
   (1) Point P is 20 mm behind H.P. and 15 mm below H.P.
   (2) Point Q is 10 mm below H.P. and 20 mm in front of V.P.
   (3) Point R is 20 mm behind V.P. and 10 mm above H.P.

Isometric view of an object is given in Figure 1.
(b) Draw the left hand view of the object. (Use first angle projection)
(c) Draw the sectional front view along with A-A using first angle projection.
Q.7  
(a) Construct a plain scale to show metres when 1 centimetre represents 5 metres and long enough to measure up to 50 metres. Mark a distance of 32 metres on the scale.

(b) Figure 2 shows the F.V. and LHSV of an object. Draw the Isometric view.

Figure 1.