

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-I & II(NEW)EXAMINATION – SUMMER 2022****Subject Code:3110013****Date:10-08-2022****Subject Name:Engineering Graphics & Design****Time:10:30 AM TO 01:30 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
<b>Q.1</b>	(a) Explain Representative Fraction. Construct a plain scale of R.F. = 1:50 to show meters and decimeters and long enough to measure 8 meters. Indicate 5.7 m distance on it.	<b>03</b>
	(b) Find the locus of a point P, moving in a plane, keeping its distances equal from two non-parallel fixed straight lines $O_1O_2$ and $O_1O_3$ .	<b>04</b>
	(c) Crank OA rotates about 'O'. (Slide along 'OC', rod BD is fixed to connecting rod AC). Draw locus of point 'D' for one complete rotation of crank OA. (Refer figure 1)	<b>07</b>
<b>Q.2</b>	(a) Construct a diagonal scale of RF = 1/4000 to show 374 meters and long enough to measure up to 500 meters.	<b>03</b>
	(b) The distance between Delhi and Agra is 200 km. In a railway map it is represented by a line 5 cm long. Find it's R.F. Draw a diagonal scale to show single km. And maximum 600 km. Indicate on it the distance of 322 km.	<b>04</b>
	(c) The foci of an ellipse are 110 mm apart. The minor axis is 70 mm long. Determine the length of major axis and draw half ellipse by rectangle method and other half by concentric circle method.	<b>07</b>
<b>OR</b>		
	(c) A circle of 50 mm diameter rolls on the circumference of another circle of 150 mm diameter and outside it. Draw the locus of the point P on the circumference of the rolling circle for one complete revolution of it. Take initial position of point P at the contact point between two circles. Name the curve.	<b>07</b>
<b>Q.3</b>	(a) Draw a cycloid for a rolling circle of 60 mm diameter rolling along a straight line without slipping. Take initial position of the tracing point at the bottom of the vertical centre line of the rolling circle.	<b>03</b>
	(b) Define the following terminology with respect to conics and also show them in a diagram: (i) Focus, (ii) Directrix, (iii) Axis, (iv) Vertex	<b>04</b>

- (c) A point P is 120 mm away from the fixed point pole O. A point P moves towards pole O and reaches the position P' in one convolution where OP' is 22 mm. The point P moves in such a way that its movement towards fixed point O, being uniform with its movement around fixed point pole O. Draw the curve traced out by the point P. Name the curve. **07**

**OR**

- Q.3** (a) Define eccentricity ratio. Write the values of eccentricity for (i) ellipse, (ii) parabola, and (iii) hyperbola **03**
- (b) Construct an ellipse when its major axis is 100 mm and minor axis 70 mm by using concentric circle method. **04**
- (c) Construct a parabola, when the distance of the focus from the directrix is 40 mm. Also draw a tangent and normal at a point on it 30 mm from F. **07**
- Q.4** (a) A rectangular plane ABCD having 60 mm X 30 mm size is parallel to V.P., and perpendicular to H.P., and P.P. Draw the projections of the rectangle when it is 40 mm in front of V.P., and one of the smaller sides is parallel to H.P. and 20 mm above it. **03**
- (b) A line PQ 100 mm long is inclined at an angle of  $45^\circ$  to H.P. and  $30^\circ$  to V.P. One of its end point 'P' is in H.P. as well as V.P. Determine its apparent inclination with V.P. **04**
- (c) A square pyramid, side of base 35 mm and axis length 50 mm is lying on the H.P. on one of its triangular faces. Draw the projections of the pyramid when the base edge contained by the triangular face on H.P. makes an angle of  $45^\circ$  on the V.P. keeping apex of the pyramid towards the observer. **07**

**OR**

- Q.4** (a) A line PQ 70 mm long is parallel to V.P. and  $30^\circ$  inclined to H.P. The end P is 30 mm above H.P. and 20 mm in front of V.P. Draw the projections. **03**
- (b) A square pyramid, base 45 mm side and axis 70 mm long has its base in H.P. all edges of the base are equally inclined to V.P. It is cut by a section plane perpendicular to V.P. and inclined at  $45^\circ$  to the H.P. such that it bisects the axis. Draw its sectional top view and front view. **04**
- (c) A line AB, 75 mm long is inclined at an angle  $35^\circ$  to the H.P. and  $55^\circ$  to the V.P. Its end point 'A' is on the H.P. and 15 mm in front of the V.P. Draw the projections of the line AB assuming it to be in the first quadrant. **07**
- Q.5** (a) Write the advantages of CAD. **03**
- (b) Prepare an isometric scale to measure 40 mm and 74 mm. **04**
- (c) Figure 2 shows F.V. and R.H.S.V. of an object. Draw isometric view. **07**

**OR**

- Q.5** (a) Write various commands used in AutoCAD and their usage. **03**
- (b) Write the comparison between first angle projection method and third angle projection method. **04**
- (c) Draw orthographic views of the figure 3 by using first angle projection method: **07**
- (i) Full sectional front view
- (ii) Top view

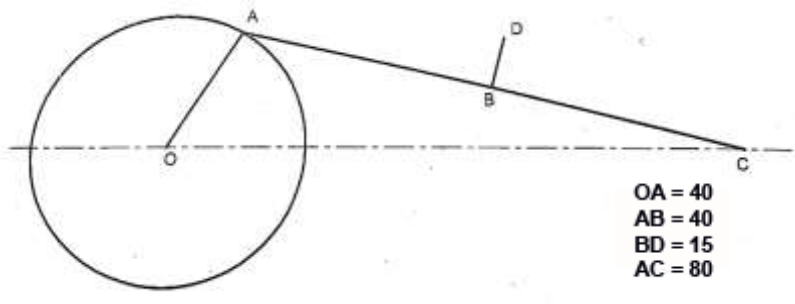


Figure 1

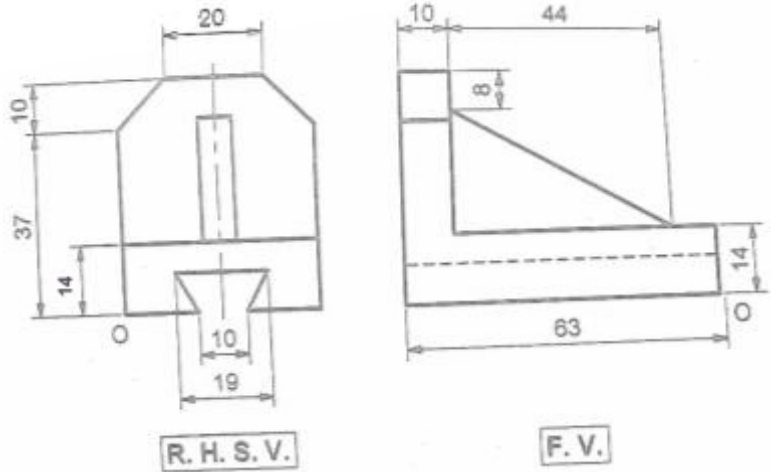


Figure 2

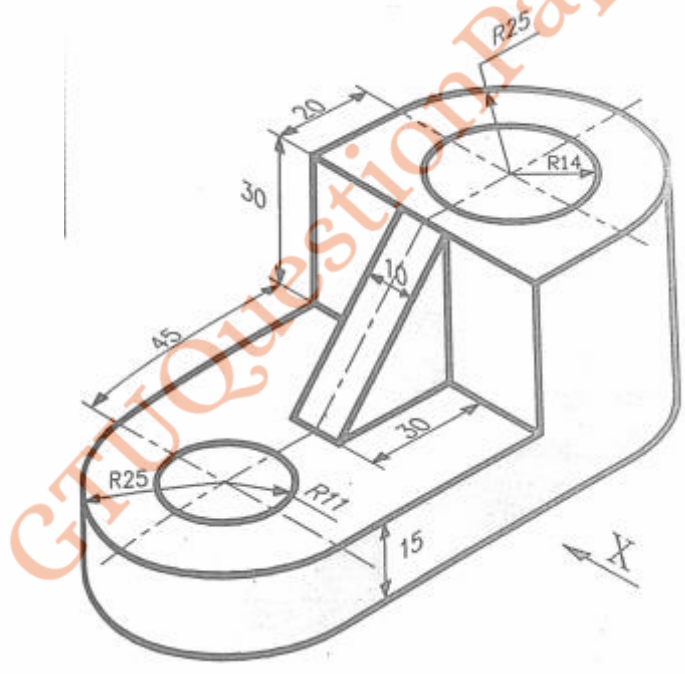


Figure 3

\*\*\*\*\*