Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–I & II EXAMINATION – WINTER 2025

Subject Code:3110013 Date:05-01-2026

Subject Name: Engineering Graphics & Design

Time:02:30 PM TO 05:30 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
Q.1	**(a)**	Construct a plain scale of R.F. = 1:10 showing the feet and inches and long enough to read the distance of 5 feet. Show on it the distance of 4 feet and 10 inches.	**03**
	(b)	A circular disc of diameter AB = 90 mm, rotates with uniform angular velocity. The point P which is at A, moves with uniform linear velocity and reaches the point B, when the disc completes one revolution. Trace the locus of point P moving from A to B.	**04**
	(c)	Construct an ellipse when the distance of its focus from its directrix is equal to 50 mm and the eccentricity is 2/3. Also, draw the tangent and normal to the ellipse at a point 70 mm away from the directrix.	**07**
Q.2	**(a)**	Draw the projections of the following points on X-Y line: (1) A point 'A' 40 mm below H.P. and 40 mm in front of V.P. (2) A point 'B' 35 mm above H.P. and 45 mm in front of V.P. (3) A point 'C' on V.P. and 30 mm above H.P.	**03**
	(b)	Classify solids based on their geometric properties.	**04**
	(c)	A straight line AB has its end A 10 mm above H.P. and end B 50 mm in front of the V.P. Draw the projections of line AB, if it is inclined to H.P. by 30° and to V.P. by 45° and the true length of the line is 50 mm.	**07**
		OR	
	(c)	The projections of the ends of a line AB are 50 mm apart. The end A is 20 mm above H.P. and 30 mm in front of the V.P. The end B is 10 mm below H.P. and 40 mm behind V.P. Determine the true length of the line AB and its inclination with H.P.	**07**
Q.3	**(a)**	Explain A.I.P. and A.V.P.	**03**
	(b)	A square prism side of base 35 mm and height 50 mm, is resting on its base in the V.P. and axis perpendicular to the V.P. and 30 mm above the H.P. One of the edges of the base is inclined to 30° to the H.P. Draw the projection of the square prism.	**04**
	(c)	A rhombus ABCD has its diagonal AC = 80 mm and BD = 50 mm. The side AD of the plane is in H.P. and the plane makes an angle of 30° with the H.P. Obtain the projections of the plane when the side CD is in V.P.	**07**
		OR	
Q.3	**(a)**	What is the apparent shape and the true shape of the section in case of the section of solid?	**03**
	(b)	OBA is a simple slider crank chain. OB is a crank of 30 mm length. BA is a connecting rod of 90 mm length. Slider A is sliding on a straight path passing through point O. Draw the locus of the mid-point of the connecting rod AB for one complete revolution of the crank OB.	**04**

	(c)	Draw the projections of a circle, of 70 mm diameter, resting on the H.P. on a point 'A' of the circumference. Plane is inclined to the H.P. such that the plan of it is an ellipse of minor axis 40 mm. The plan of the diameter, through point 'A', is making an angle of 45° with the V.P. Measure the angle of the plane with the H.P.	**07**
Q.4	**(a)**	Define ellipse, parabola and hyperbola based on eccentricity ratio.	**03**
	(b)	Explain different types of lines with their illustrations and applications.	**04**
	(c)	A hexagonal pyramid base 30 mm and height 60 mm is resting, on H.P. on its base with two sides of base perpendicular to V.P. It is cut by an Auxiliary Inclined Plane (A.I.P.), inclined to H.P. by 45°, passing to a point 25 mm from the apex on the axis. Draw the front view, sectional top view and true shape of the section.	**07**

OR

Q.4	**(a)**	Explain first angle and third angle projection system with their symbols.	**03**
	(b)	What are the advantages and disadvantages of using AUTOCAD?	**04**
	(c)	The development of a cone is a semicircle of 80 mm radius having a circular hole of 80 mm diameter. Draw the plan and elevation of the cone along with periphery of a circular hole shown on them.	**07**
Q.5	**(a)**	Differentiate between aligned system and unidirectional system of dimensioning using sketches.	**03**
	(b)	Draw isometric circle on the three sides of cube of 60 mm dimension using four centre method.	**04**
	(c)	**Fig. 1** shows pictorial view of an object. Draw following views: (1) Front view looking in the direction X, (2) Left Hand Side View. Use first angle projection method.	**07**

OR

Q.5	**(a)**	Draw isometric scale showing 100 mm normal scale.	**03**
	(b)	Explain the following AUTOCAD commands (i) Trim, (ii) Arc, (iii) Mirror, (iv) Array	**04**
	(c)	**Fig. 2** shows F.V. and T.V. of an object. Draw isometric view.	**07**

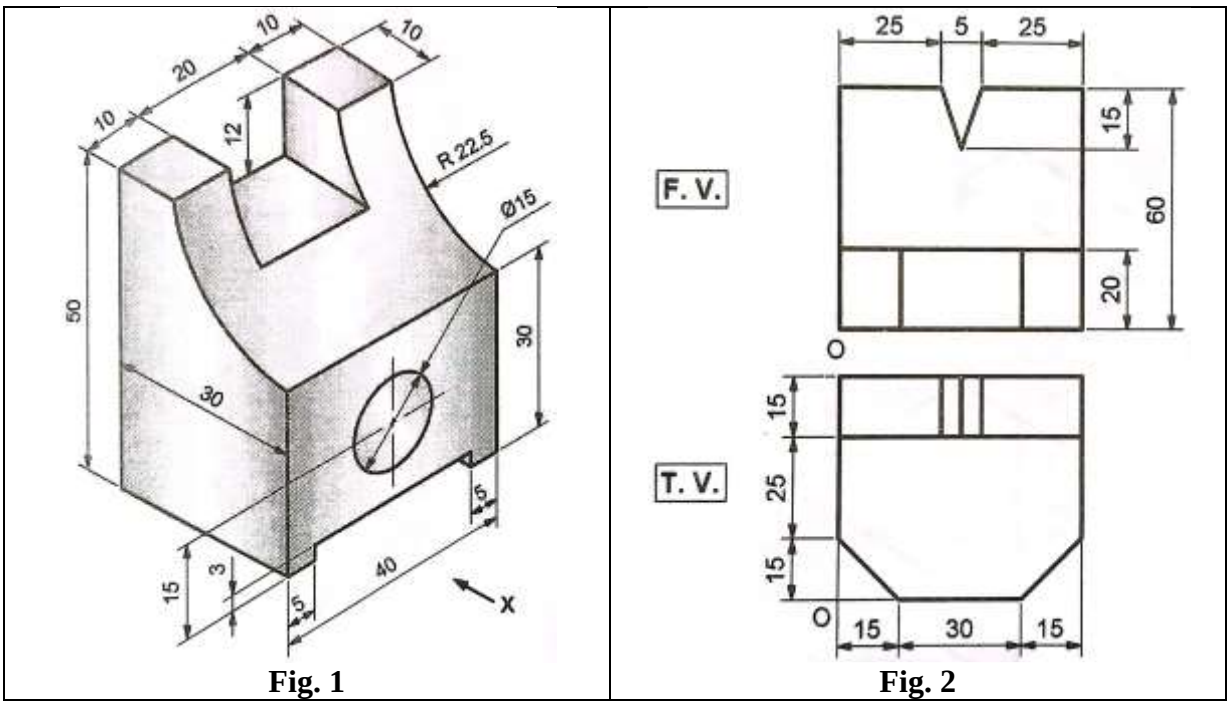

Fig. 1 **Fig. 2**