Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE –SEMESTER 1&2(NEW SYLLABUS)EXAMINATION- WINTER 2018

Subject Code: 3110013 Date: 16-01-2019

Subject Name: ENGINEERING GRAPHICS & DESIGN

Time: 10:30 am to 01:00 pm Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			Marks
Q.1	**(a)**	For 100 cm of a line compare size of drawing length on basis of full scale, reducing scale & enlarged scale.	**03**
	(b)	Prepare isometric scale to measure 40mm and 74mm.	**04**
	(c)	Point P of a straight line PQ is 25mm above H.P. and point Q is 65 mm in-front of V.P. The line makes an angle of 30° with H.P. and its plan is at 45° to the XY line. Draw the projections of the line if the plan length is 70mm. Also find the true length of the line and the angle made by the line with V.P.	**07**
Q.2	**(a)**	List two applications of an ellipse, parabola and Hyperbola.	**03**
	(b)	For the cuboid 50 x 30 x 20, draw all six orthographic views using 3rd angle projection method.	**04**
	(c)	A point P moves towards another point O, 90 mm from it, and reaches it during 1.5 revolutions around it in clockwise direction. Its movement towards O is uniform with its movement around it. Draw the curve traced out by the point P and name it.	**07**
		OR	
	(c)	A fixed point is 54 mm away from a fixed straight line. Draw the locus of a point P moving in such a way that the ratio of its distance from the fixed straight line is 5:4. Name the curve.	**07**
Q.3	**(a)**	Draw projection of following points (i) Point R is 10 mm behind V.P. & 20 mm above H.P. (ii) Point S is in H.P. & 22 mm in front of V.P. (iii) Point T is 15 mm in front of V.P & 25 mm below H.P.	**03**
	(b)	A line AB, 75mm long, is parallel to VP and inclined to the HP, by an angle 45° . Point A is 30mm below HP and 20mm in front of VP. Point B is in the first quadrant. Draw the projections of the straight line AB.	**04**
	(c)	A line PQ, 100 mm long, is inclined at 30° to the HP and 45° to the VP. Its mid-point M is in the VP and 20mm above the HP. Draw its projections, when its end P is in the first quadrant and Q is in the third quadrant.	**07**
		OR	
Q.3	**(a)**	Draw Projections of the following lines. (i) Line MN 50mm is in 1st quadrant and parallels both H.P. & V.P. (ii) Line PQ 35mm is in 3rd quadrant and remains perpendicular to V.P. and parallel to H.P.	**03**
	(b)	A square plate PQRS, edge 25mm, is in space with one of its corners in VP. Surface of the plate makes 50° with VP and it is perpendicular to HP. Draw its projections.	**04**
	(c)	The distance between the end projectors of a straight line PQ is 60mm. The line makes 30° and 45° angles with HP and VP, respectively. The	**07**

end P is 30mm below HP and 50mm in front of the VP. Draw its projections when end Q is in third quadrant. Find TL of the line.

Q.4 **(a)** Define apparent shape and true shape with diagram. **03**

(b) Draw the development of pentagonal prism of side 30mm and height 60mm, when one of the edges of the base is perpendicular to VP. **04**

(c) An isosceles triangular plate ABC has its base 45mm and altitude 60mm. It is so placed that the front view is seen as an equilateral triangle of 45mm side and (i) base is inclined at 45° to HP (ii) side is inclined at 45° to HP. Draw its plan when its corner A is on HP. **07**

OR

Q.4 **(a)** Define right solid, oblique solid and regular solid. **03**

(b) A cone, diameter of base 55mm and height 60mm, is resting on HP on one of its generators with axis parallel to VP. Draw the projections of cone. **04**

(c) A semicircular plate of 80mm diameter has its straight edge in the VP and inclined at 45° to the HP. The surface of the plate makes an angle of 30° with the VP. Draw its projections. **07**

Q.5 **(a)** Why chamfer is done on work piece. Write the steps to create chamfer in AUTOCAD. **03**

(b) List and explain different methods to draw circle in AUTOCAD. **04**

(c) Draw the (i) Front view (ii) Right hand side view and (iii) Top view of Fig. 02 in first angle projection method. Consider length as 50mm in direction of X. **07**

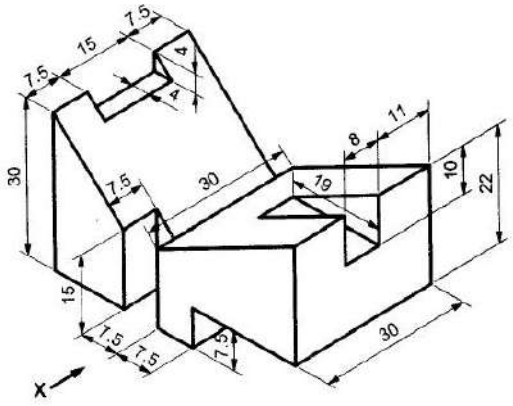

Fig.02

OR

Q.5 **(a)** Write difference between line, polyline and its uses in AUTOCAD. **03**

(b) List and explain different methods to draw rectangle in AUTOCAD. **04**

(c) Draw isometric view of the Fig.03 given below. **07**

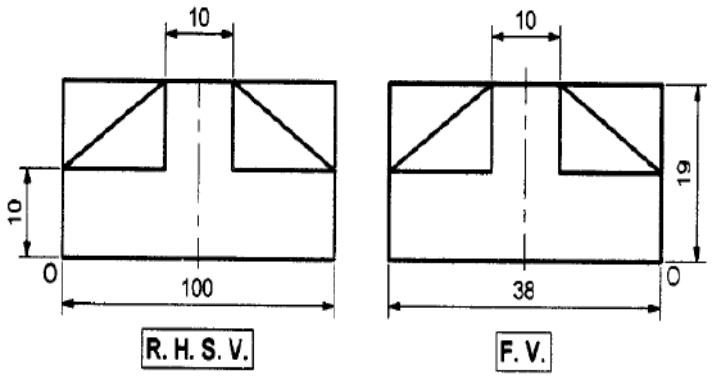

Fig.03

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– I & II (NEW) EXAMINATION – WINTER 2019

Subject Code: 3110013 **Date: 09/01/2020**

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.**

			Marks
Q.1	**(a)**	Construct a scale of 1cm = 1 m to read meters and decimeters and long enough to measure up to 14 meters. Show on this scale a distance equal to 12.4 meters.	**03**
	(b)	OAB is a slider crank mechanism. Slider B is sliding on a straight path passing through O as shown in Figure 1 given below. Crank OA is 30 mm and rotates in anticlockwise direction and length of connecting red AB is 100 mm. A rod NP of 30 mm length is attached to AB such that AN = 40 mm and NP is perpendicular to AB as shown Draw locus of point P for one complete revolution of the crank.	**04**

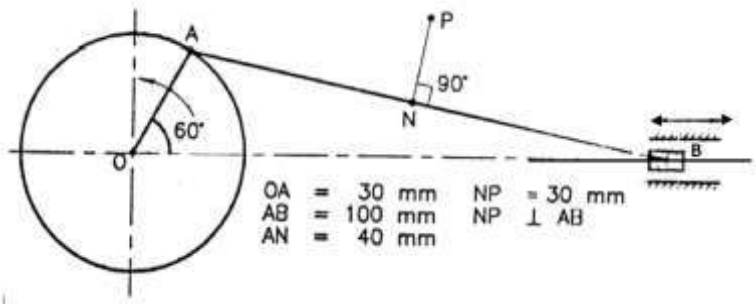

Figure 1.

	(c)	Draw a parabola by tangent method, given its base as 90 mm and the height of axis is 75 mm.	**07**
Q.2	**(a)**	A rectangle ABCD 60 mm x 40 mm, is parallel to HP with one of its sides inclined at 30^o to VP and the end of the side near to VP is 15 mm in front of the VP and 30 mm above HP. Draw its projections.	**03**
	(b)	Point A is 20 mm above HP and 30 mm in front of VP and point B is in the HP and 40 mm behind the VP. The distance between in their projectors is 50 mm. Draw the projections of the points. Also draw straight lines joining their top and front views.	**04**
	(c)	The end P of a line PQ 120 mm long is 30 mm above HP and 60 mm behind VP. The line is incline at angle of 30^o with the reference plans of the projection. The point Q is below HP and behind VP. Draw the projections of line PQ and locate the point Q.	**07**
		OR	
	(c)	Plan and elevation of a line AB, 80 mm long, measure 60 mm and 72 mm respectively. End A of the line is in HP and end B is in VP. Draw its projections, assuming the line to lie in first quadrant.	**07**

Q.3	**(a)**	What is the difference between a First Angle and Third Angle projection?	**03**
	(b)	A right regular pentagonal pyramid, edges of base 25 mm and height 50 mm, has its base parallel to VP with one of its base edges in HP. Draw its projections. (FV and TV)	**04**
	(c)	A regular hexagon lamina ABCDEF has a side AB in VP and its side DE 45 mm in front of the VP and inclined to HP at 30^o. Draw its projections. Consider size of lamina as 50mm.	**07**

OR

Q.3	**(a)**	Draw the conventional symbols for First Angle and Third Angle projection.	**03**
	(b)	A right regular pentagon prism, edge of base 30 mm and height 75 mm resting on its base on HP, is cut by a section plane inclined to HP at 45^o and meeting the axis at a distance of 18 mm from its top end. Develop the outside surface of the cut prism.	**04**
	(c)	Draw the projections of rhombus diagonals 96 mm and 48 mm long. The smaller diagonal is parallel to both the reference planes, while the other diagonal is inclined at 30^o to the HP and has one of its end points in the HP. Keep the center of rhombus 56 mm in front of the VP.	**07**

Q.4	**(a)**	Write difference between line, polyline and its uses in AUTOCAD.	**03**
	(b)	List and explain different methods to draw arc in AUTOCAD.	**04**
	(c)	One of the rectangular faces of the vertical square prism, 40 mm side and axis 65 mm long, make an angle of 30^o to VP. It is cut by an AIP passing through the center of the axis in making an angle of 40^o to HP. Draw front view, sectional top view and true shape of the section.	**07**

OR

Q.4	**(a)**	List the six Essential Commands of Modify Panel in AutoCAD.	**03**
	(b)	List and explain different methods to draw Polygon in AUTOCAD.	**04**
	(c)	A square pyramid, side of base 40mm and axis 60 mm long, has its base in HP and all edges of the base are equally inclined to VP. It is cut by a section plane perpendicular to the VP and inclined 45^o to the HP such that it bisect the axis. Draw its sectional top view and sectional left side view.	**07**

Q.5	**(a)**	Draw the isometric scale of 80 mm long line and show 66 mm isometric length on it.	**03**
	(b)	Draw the isometric view of the cone of 48 mm base diameter and 56 mm axis height.	**04**
	(c)	Draw and dimension completely, the following views according to first angle projection method and to full size scale of a given figure 2. • Front view looking in the direction of arrow F, • Side view looking direction of arrow S, • Top view looking the direction of arrow P.	**07**

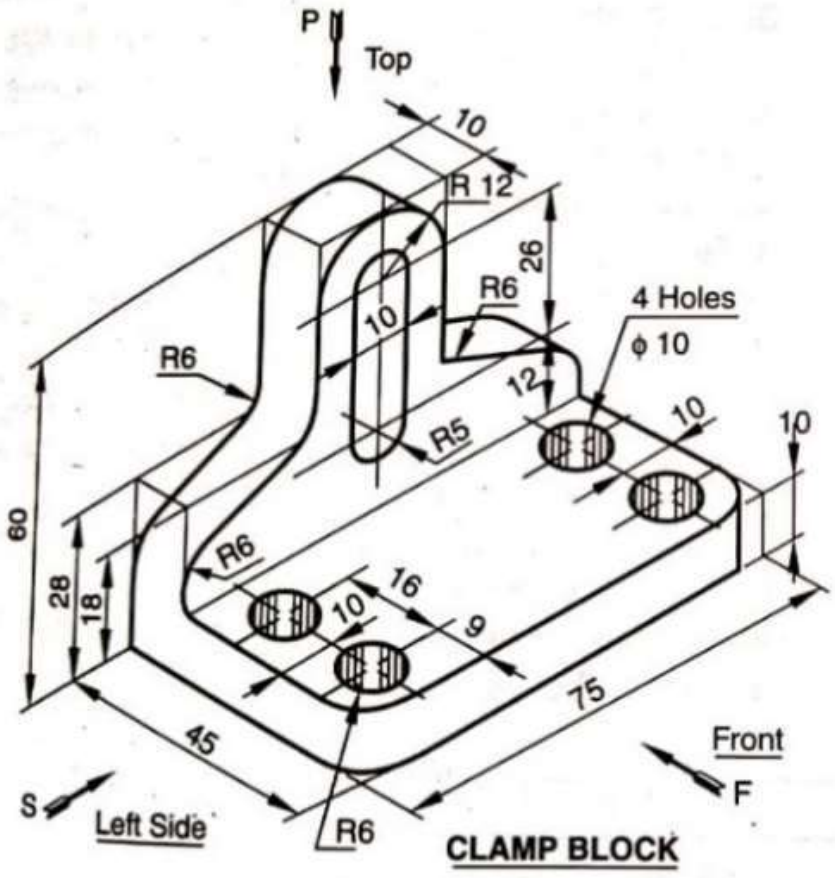

Figure 2.

OR

Q.5 **(a)** Draw the front view looking in direction of arrow according to first angle projection method to full size scale of a given figure 3 with completely dimension. **03**

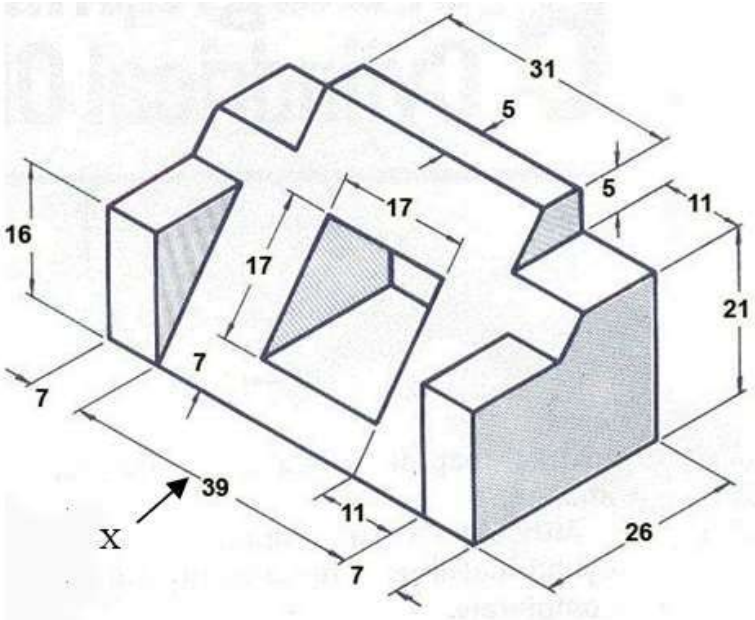

Figure 3.

(b) Draw and dimension completely, the following view according to First angle projection method and to full size scale of a given figure 3. **04**

- Top View and right hand side view.

(c) Figure 4 shows three orthographic views according to first angle projection method of an object. Draw its isometric projection. **07**

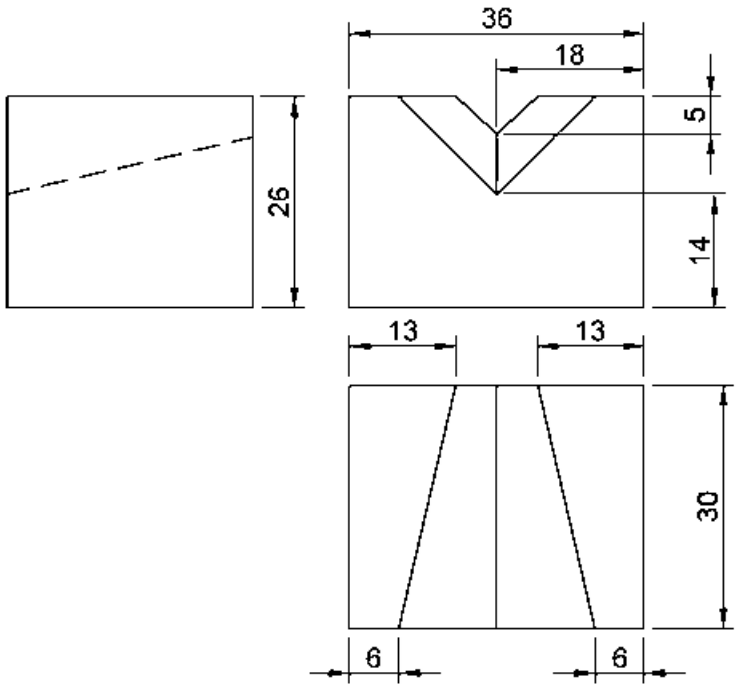

Figure 4.

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–1/2 EXAMINATION – WINTER 2021

Subject Code:3110013 Date:28/03/2022

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.**

Q.1	**(a)**	(i)Which type of line is use to indicate long break line (continuous thin with zig-zags line)? (ii) Which type of line is use to indicate hidden lines (dashed medium thick line)? (iii) What is Representative Fraction/Scale Factor?	**3**
	(b)	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 rectangular method.	**4**
	(c)	Construct the involute of circle of 30 mm diameter for one turn. Draw tangent and normal to the involute at any point on it.	**7**
Q.2	**(a)**	Draw the projections of the following points on the same X-Y lime. (1) Point A 25 mm below H.P. and 20 mm in front of V.P. (2) Point B 35 mm above H.P. and 40 mm in front of V.P. (3) Point C on V.P. and 30 mm above H.P.	**3**
	(b)	The foci of an ellipse are 110 mm apart. The minor axis is 70 mm long. Draw half ellipse by concentric circle method.	**4**
	(c)	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 discs complete one revolution. Trace the locus of point P moving from A to B.	**7**
		OR	
	(c)	Construct the involute of a hexagon of side 20 mm. Draw tangent and normal to the involute at any point.	**7**
Q.3	**(a)**	Draw projection of line CD is 50 mm long, when it is not contained by any plane and parallel to both planes. A line CD is 20 mm above H.P. and 25 mm in front of V.P.	**3**
	(b)	A circular plane having 50 mm diameter is resting with point A of its periphery on H.P. The surface of plane is inclined with 30^o H.P. Draw the projection of this circular plane.	**4**
	(c)	A straight line AB 110 mm long is inclined at 30^0 to H.P. and 45^0 to V.P. One of its end A is 40 mm from the V.P. and 20 mm above H.P. Draw the projection of line AB.	**7**

OR

Q.3 **(a)** A line PQ 130 mm long is parallel to the V.P. and inclined at 60^0 to H.P. The end nearest to the H.P. is 30 mm from it and 40 mm from the V.P. Draw the projection of line PQ. **3**

(b) A rectangular plane ABCD having 60 mm × 30 mm size is parallel to H.P. and perpendicular to V.P. and P.P. Draw the projections of the rectangular when it is 40 mm above H.P. and one of the longer sides is parallel to V.P. and 20 mm in front of it. **4**

(c) A square plane ABCD is of 30 mm side. It is kept on V.P. on one of its corner and it is inclined to V.P. at an angle of 30^o. The surface of the plane is perpendicular to H.P. Draw the projection of plane **7**

Q.4 **(a)** Draw the following sketches: Truncated Cylinder, Frustum of a cone and Frustum of a square pyramid. **3**

(b) A square prism edge of base 35 mm and axis length 50 mm is resting on its base on the H.P. with an edge of base parallel to V.P. Draw the projection of prism. **4**

(c) Draw the development of lateral surfaces of a pentagonal prism with edge of base 40 mm and height 90 mm, kept on H.P. on its edge of base with an angle of base parallel to V.P. When it is cut by an AIP inclined at 30^0 to H.P. and bisecting the axis of the prism. Refer Figure No 1 **7**

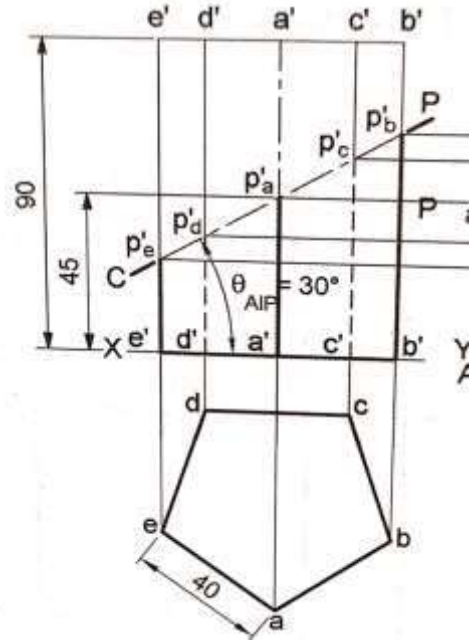

Figure No 1

OR

Q.4 **(a)** A square prism side of base 30 mm and its axis is 50 mm is kept on H.P. on its base such that two side of base are perpendicular to V.P. It is cut by the horizontal cutting plane which cuts the axis at its midpoint. Draw front view and sectional top view. **3**

(b) Differentiate isometric projections and orthographic projections. **4**

(c) Figure No. 2 shows pictorial view of an object. Draw Front view looking in the direction F and also draw any one side view. **7**

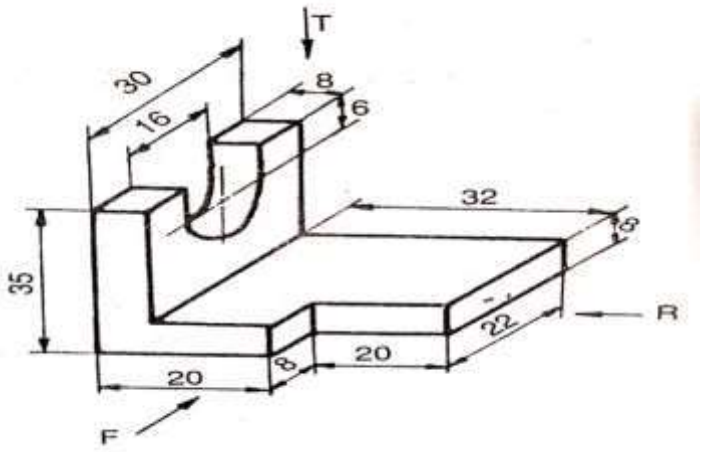

Figure No. 2

Q.5 **(a)** Draw the pictorial view of truncated hexagonal pyramid. **3**

(b) What are the various applications of Auto CAD? **4**

(c) Figure No. 3 shows pictorial view of an object. Draw Front view looking in the direction F and also draw any one side view. **7**

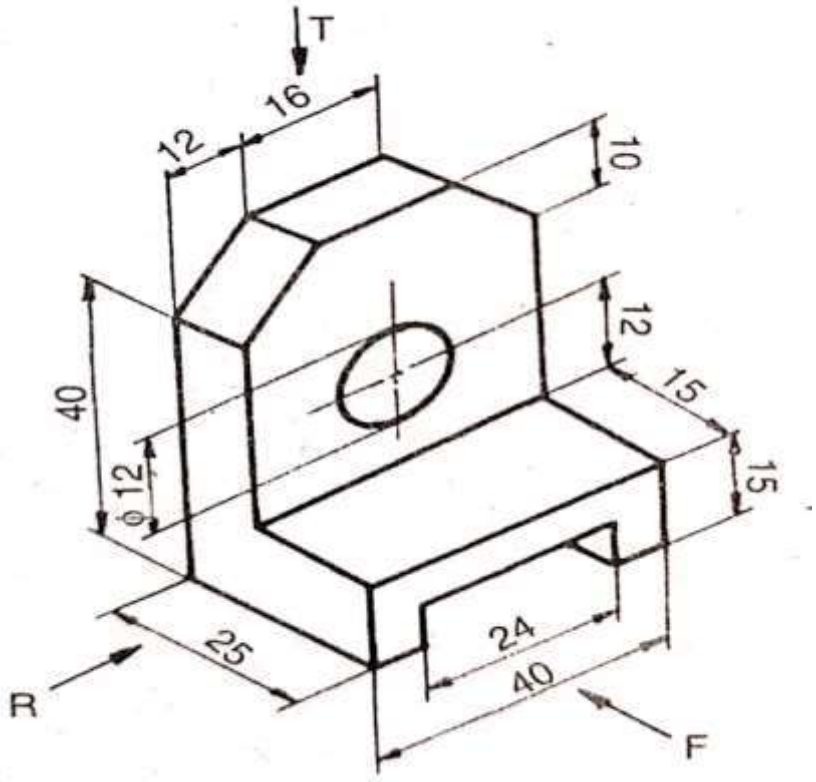

Figure No. 3

OR

Q.5 **(a)** State some of important command use in auto CAD. **3**

(b) What are the various advantages of Auto CAD? **4**

(c) Figure No. 4 shows front view and top view of an object. Draw isometric view. Total height cover by the object is 60 mm. **7**

Sol

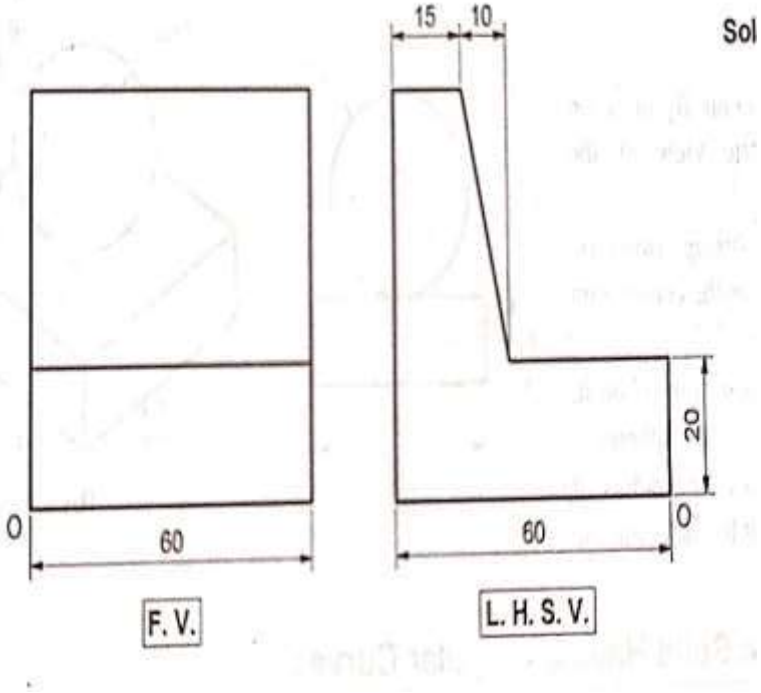

Figure No. 4

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–I &II (NEW) EXAMINATION – SUMMER-2019

Subject Code: 3110013 Date: 18/06/2019

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.**

Q.1	**(a)**	Draw a diagonal scale of R.F, 1:5 showing decimeters, centimeters and millimeters and long enough to measure upto 8 decimeters. Show a distance of 5.35 dm.	**03**
	(b)	In the mechanism shown in Fig.1, the connecting rod is constrained to pass through the trunnion at D. Trace the locus of the end C and a point P on BC for one complete revolution of the crank. In Fig. 1 consider AB as 30 mm.	**04**
	(c)	A line AB is 100 mm long. It is inclined at 40° to the HP and 30° to the VP. The end A is 10 mm above HP and 25 mm in front of VP. Assuming the end B in the first quadrant, draw the projections of the line AB.	**07**
Q.2	**(a)**	Explain the following autocad commands : hatch, circle and array.	**03**
	(b)	Explain the following autocad commands : mirror, trim, extend and fillet.	**04**
	(c)	A triangle ABC has sides AB = 75 mm, BC = 60 mm and CA = 75 mm. Draw a parabola passing through points A, B and C when side BC is horizontal.	**07**
		OR	
	(c)	Draw an epicycloid with rolling circle diameter 50 mm and directing circle diameter 150 mm. Draw tangent and normal at a point on the curve 110 mm from the centre of the directing circle.	**07**
Q.3	**(a)**	Define the following curves : involute, ellipse and cycloid.	**03**
	(b)	The distance between the end projectors of a straight line AB is 60 mm. Point A is 5 mm above HP and 30 mm in front of VP. Point B is 40 mm above HP and 50 mm behind VP. Draw the projections and find the inclination of straight line AB with HP and VP and the true length of the line.	**04**
	(c)	An isosceles triangular plate of 50 mm base and 75 mm altitude, appears as an equilateral triangle of 50 mm in top view. Draw the projections of a plate if its 50 mm long edge is on the HP and inclined at 45° to the VP. What is the inclination of the plate with the HP ?	**07**
		OR	
Q.3	**(a)**	Draw the projections of the following points on the same x-y line : (i) Point A is 20 mm above the HP and 20 mm behind the VP. (ii) Point B is 40 mm above HP and 10 in front of VP. (iii) Point C is 25 mm below HP and 40 mm behind VP.	**03**
	(b)	Two lemons on a tree, planted near the compound wall of a bunglow are 1.0 m and 1.25 m above the ground and 0.5 m and 0.75 m from a 15 cm thick compound wall but on opposite sides of it. The distance between lemons measured along the ground and parallel to the wall is 1.0 m. Determine the real distance between the centres of two lemons.	**04**

(c) ABCDE is a regular pentagonal plate of 40 mm sides, has its corner A on the HP. The plate is inclined to the HP such that the plan length of the edges AB and AE is each 35 mm. The side CD is parallel to both the reference planes. Draw the projections of the plate and find its inclination with the HP. **07**

Q.4 **(a)** Draw the projections of a cone, base 60 mm diameter and axis 90 mm long when it is resting on the HP on a point on its base circle with the axis making an angle of 30° with the HP and parallel to the VP. **03**

(b) Fig.2 shows the front view of a cut hexagonal pyramid. Draw the development of the lateral surface of the remaining portion of the pyramid. **04**

(c) A cylinder is resting on HP on its base. It is cut by AVP perpendicular to HP and inclined to VP by 45° and cutting it remaining 12 mm away from the axis. Draw the projections with section and draw also the true shape of the section. Take diameter of cylinder 55 mm and height 60 mm. **07**

OR

Q.4 **(a)** Differentiate between **03**

(i) Prism and pyramid
(ii) Square pyramid and tetrahedron
(iii) Cube and square prism

(b) Draw the plan and elevation of a cone resting on HP on its base. Show on them the shortest path followed by a fly moving around the cone and returning to the same starting point. Fly starts from a point on the periphery of base. Take base diameter of cone 80 mm and height of axis 90 mm. **04**

(c) A cone of 70 mm diameter of the base circle and 60 mm length of axis is resting on its base on the HP. It is cut by an AIP so that true shape of the section is an isosceles triangle with the vertex angle of 50°. Set the required cutting plane and find its inclination with the HP. Draw sectional top view, front view and project the true shape of the section. **07**

Q.5 **(a)** Differentiate between aligned system and unidirectional system of dimensioning. **03**

(b) Using third angle projection method draw right hand side view for the object shown in Fig. 3. **04**

(c) Using third angle projection method draw front view and top view for the object shown in Fig. 3. **07**

OR

Q.5 **(a)** A circular plate, 50 mm diameter is resting on HP on one of the points of its periphery with surface of the plate perpendicular to VP and inclined to HP by 30°. Draw two projections of the circular plate. **03**

(b) Draw isometric view from the orthographic projection shown in Fig. 4. **11**

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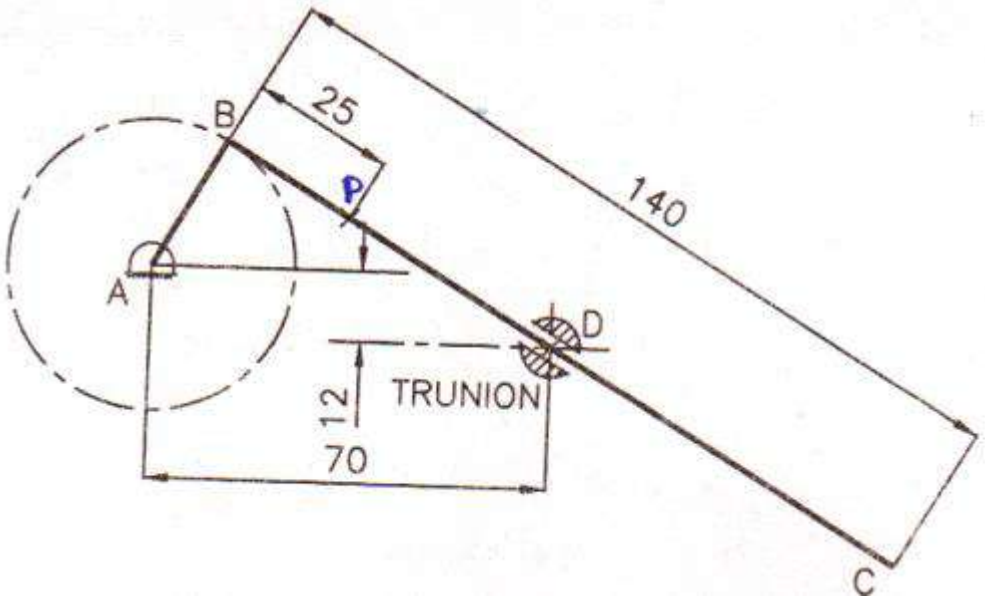


Fig. 1

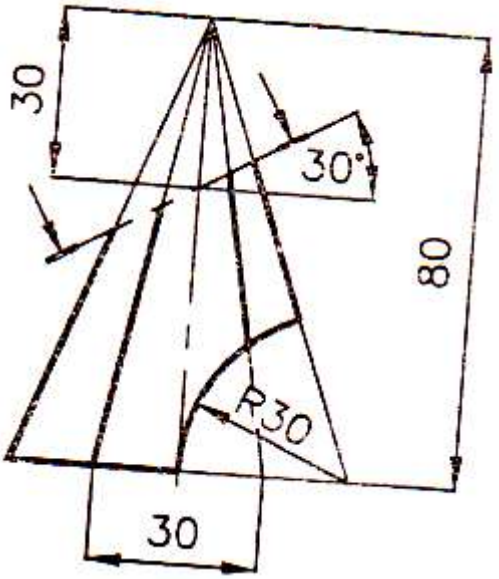
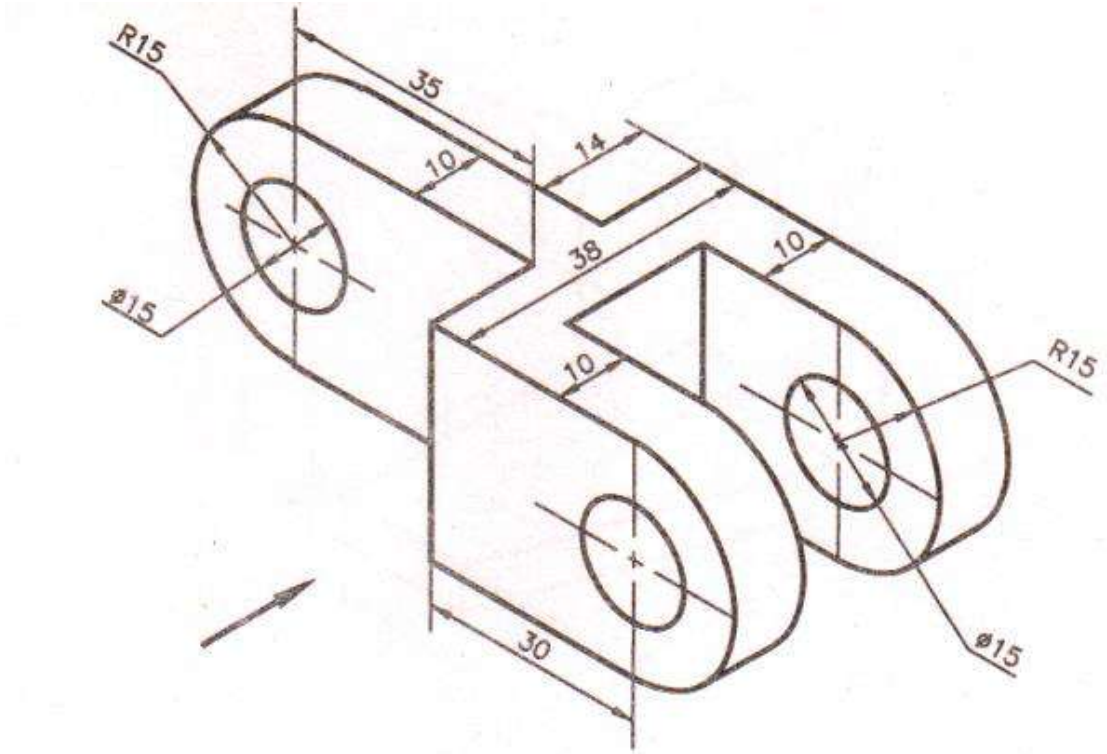


Fig.2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10
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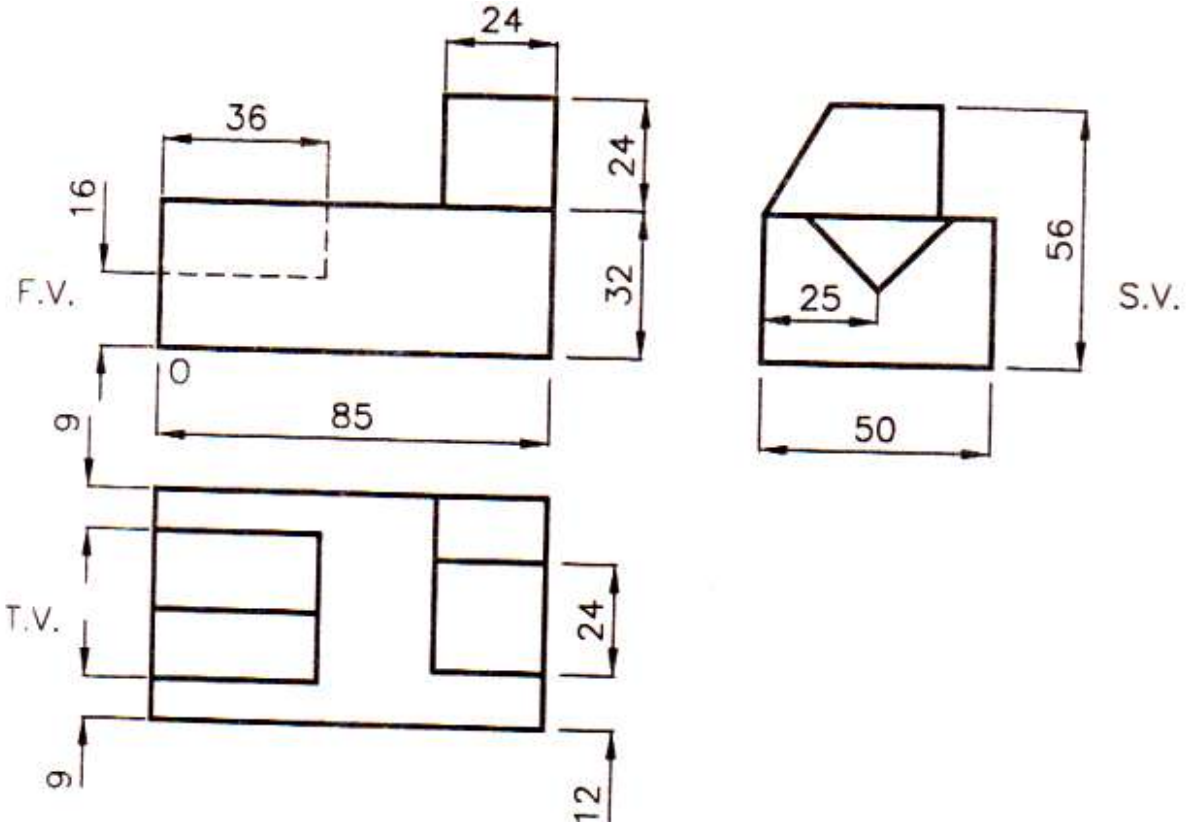
Fig.3


24
36
16
24
32
F.V.
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85
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56
25
S.V.
50
T.V.
24
9
12

Fig.4

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER 1&2 EXAMINATION – SUMMER 2020

Subject Code: 3110013 Date:05/11/2020

Subject Name: Engineering Graphics and 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.**

Q.1	**(a)**	Define Representative Fraction (RF). Find RF if 5 cm in the drawing is equal to 10 km.	**03**
	(b)	Give the definitions of the following curves: (i) Ellipse (ii) Involute	**04**
	(c)	Draw epicycloid of a 40 mm diameter circle, which rolls outside on another circle of 150 mm diameter for one revolution clockwise. Draw a tangent and normal to it at a point 95 mm from the center of the directing circle.	**07**
Q.2	**(a)**	Draw the projections of the following points on the same X-Y line. (a) Point 'A' is 20 mm below H.P and 20 mm in front of VP. (b) Point 'B' is 30 mm above H.P and 40 mm in front of VP. (c) Point 'C' is on VP and 30 mm above HP.	**03**
	(b)	The top view of a 75 mm long line AB measures 65 mm, while its front view measures 50 mm. It's one end 'A' is in HP and12 mm in front of VP. Draw the projections of AB and determine its inclination with HP and VP.	**04**
	(c)	A line AB 100 mm long is inclined to HP at 45^o and inclined to VP at 30^o. Draw front and top views of line and determine their lengths. Also determine the perpendicular distance of end B from both HP and VP.	**07**
		OR	
	(c)	A line PQ 85 mm long has its end 'P' 10 mm above HP and 15 mm in front of VP. The top view and front view of line PQ are 75 mm and 80 mm respectively. Draw its projections. Also determine the true and apparent inclinations of the line.	**07**
Q.3	**(a)**	A square lamina of 40 mm side rests on one of its sides on HP. The lamina makes 30^o with HP and the side on which it rests makes 45^o with VP. Draw its projections.	**03**
	(b)	Draw the development of the lateral surfaces of a square pyramid, side of base 25 mm and height 50 mm, resting with its base on HP and an edge of the base is parallel to VP.	**04**
	(c)	A hexagonal prism with side of base 30 mm and axis length 60 mm is resting on one of its base edge on HP such that its axis is inclined at 45^o with HP and the side on which it is resting is inclined at 30^o with VP. Draw the projections.	**07**
		OR	
Q.3	**(a)**	Give complete classification of solids.	**03**
	(b)	A regular pentagon laminate of 30 mm each side is resting on HP on one of its sides with its surface making 45^o with HP. Draw its projection when the side in HP makes an angle 30^o with VP.	**04**

	(c)	A square base pyramid with 40 mm side and axis 65 mm long, has its base on the HP and all the edges of the base are equally inclined to the VP. It is cut by a section plane perpendicular to the VP and inclined at 45^o to the HP. Further, it is bisecting the axis of the pyramid. Draw its sectional top view, sectional side view and true shape of the section.	**07**
Q.4	**(a)**	Write any three main differences between first angle and third angle projection system.	**03**
	(b)	In a slider crank mechanism **(Figure-1)**, the connecting rod is 160 mm and crank is 40 mm in length. The other end point of connecting rod on the slider moves along a straight line passing through the center of crank rotation. Trace the locus of midpoint 'P' of the connecting rod.	**04**
	(c)	Draw front view, top view and right-hand side view of the object given in **Figure-2** using first angle projection.	**07**
		OR	
Q.4	**(a)**	Explain following commands: (i) Line (ii) Poly Line (iii) Circle	**03**
	(b)	List and explain different methods to draw a polygon in AUTOCAD.	**04**
	(c)	**Figure-3** shows the pictorial view of an object, draw the following views using first angle method of projection. Also give the important dimensions. (i) Sectional front view, along section A-A (ii) Top View	**07**
Q.5	**(a)**	What are the benefits of Computer Aided Drawing.	**03**
	(b)	Draw isometric circle on the three side of cube of 60 mm dimension.	**04**
	(c)	Draw isometric drawing of an object whose projections are given in **Figure–4**.	**07**
		OR	
Q.5	**(a)**	Draw the figure to explain the aligned and unidirectional system of dimensioning.	**03**
	(b)	Draw an isometric scale of 100 mm length and show 30 and 60 mm length on the scale.	**04**
	(c)	Draw isometric drawing of an object whose projections are given in **Figure–5**.	**07**

FIGURES

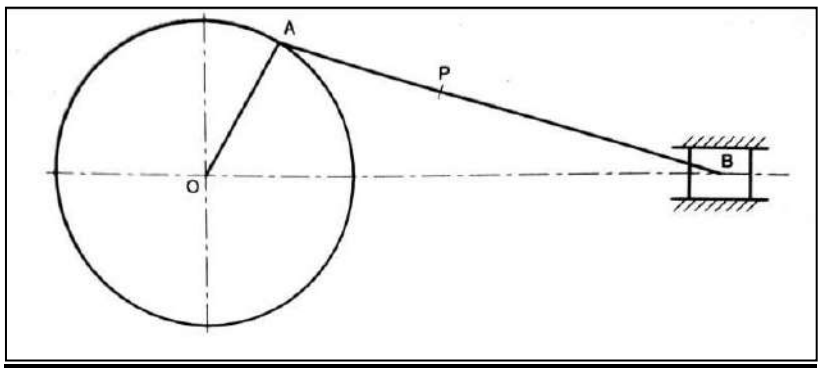

Figure-1[Q4 (b)]

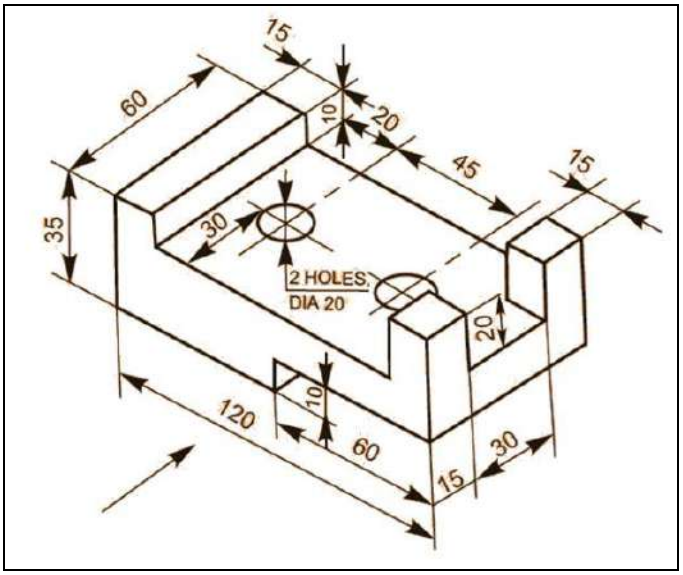

Figure-2 [Q4 (c)]

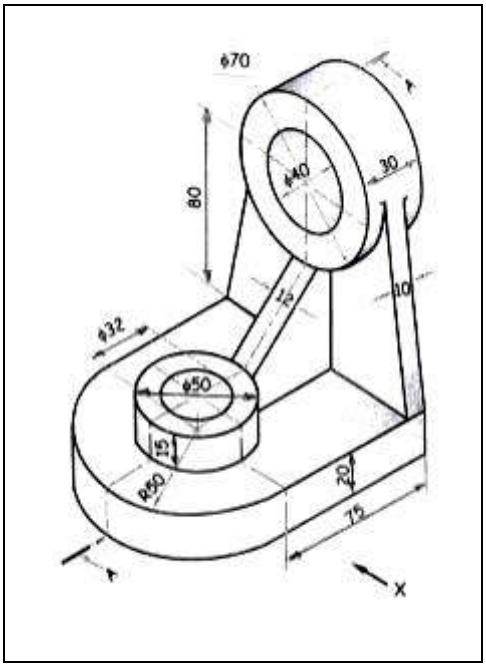

Figure-3 [(OR) Q4 (c)]

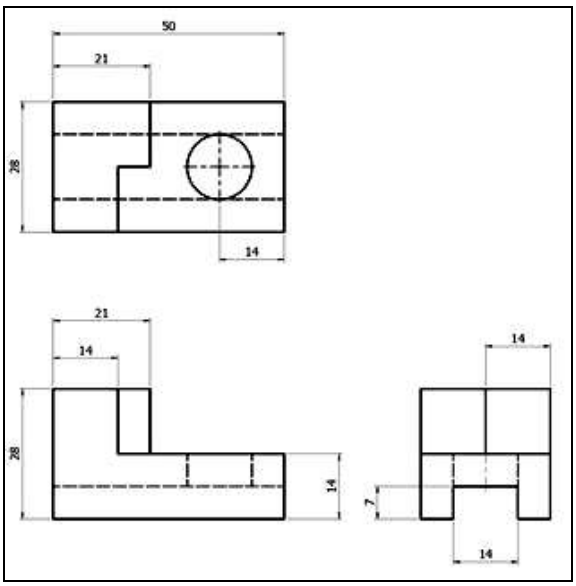

Figure-4 [Q.5 (c)]

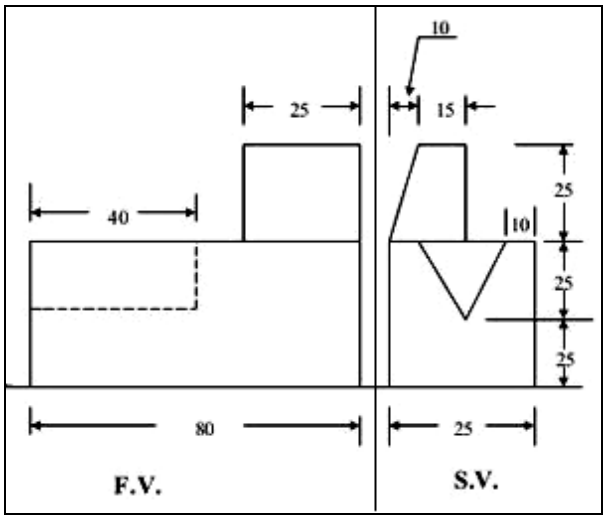

Figure-5 [(OR)Q.5 (c)]

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Seat No.: _____ Enrolment No._____

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
Q.1	**(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.	**03**
	(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.	**04**
	(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)	**07**
Q.2	**(a)**	Construct a diagonal scale of RF = 1/4000 to show 374 meters and long enough to measure up to 500 meters.	**03**
	(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.	**04**
	(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.	**07**
		OR	
	(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.	**07**
Q.3	**(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.	**03**
	(b)	Define the following terminology with respect to conics and also show them in a diagram: (i) Focus, (ii) Directrix, (iii) Axis, (iv) Vertex	**04**

	(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° to H.P. and 30° to V.P. One of its end point 'P' is in H.P. as well as VP. 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° 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° 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° 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° to the H.P. and 55° 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: (i) Full sectional front view (ii) Top view	**07**

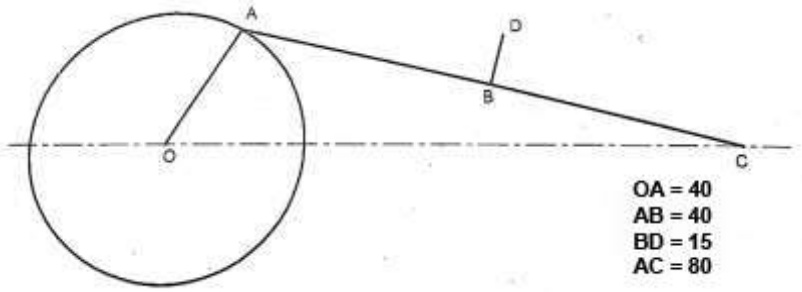

Figure 1

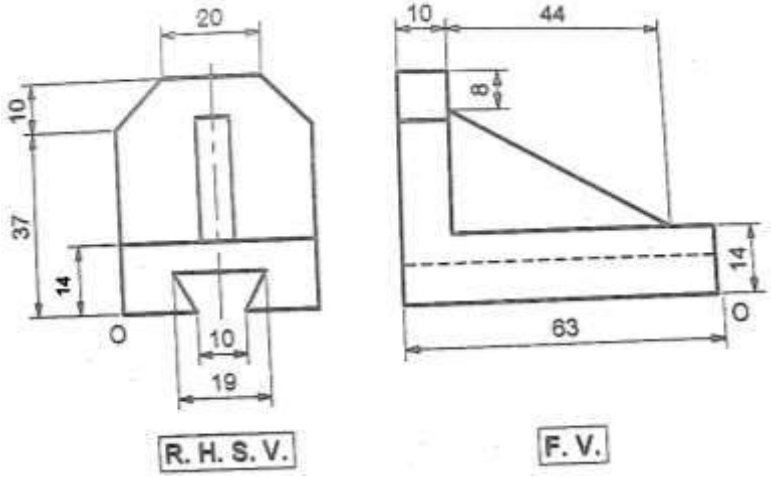

Figure 2

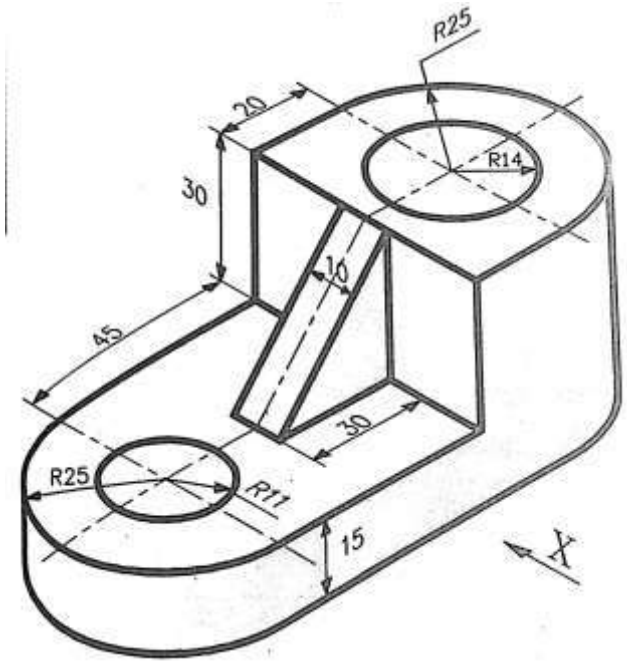

Figure 3

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