Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2018

Subject Code:2162006 **Date:30/11/2018**

Subject Name:Computer Aided Design for Mechatronics

Time: 02:30 PM TO 05:00 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)**	Give Specification of Workstations.	**03**
	(b)	Differentiate between Vector display and Raster display.	**04**
	(c)	Explain Bresenham's algorithm for generation of line and also write down advantage of Bresenham's algorithm.	**07**
Q.2	**(a)**	Explain the Working of Digitizers.	**03**
	(b)	State the advantages of computer aided design.	**04**
	(c)	What is Graphic Standard? Enlist them. Explain any one of them.	**07**
		OR	
	(c)	Explain the following two-dimensional geometric transformation: (1) Translation (2) Rotation (3) Scaling (4) Reflection	**07**
Q.3	**(a)**	A triangle A(1,1), B(3,3) & C(4,1) is to be translated by 4 units in X-direction and 2 units in Y-direction.	**03**
	(b)	Define Topology & Geometry.	**04**
	(c)	A rectangle ABCD has vertices A(10,15), B(25,15), C(25,25) and D(10,25). This rectangle is to be reflected about a line P(25,20) and Q(10,30). Determine the vertices of transformed rectangle.	**07**
		OR	
Q.3	**(a)**	Explain sweeping for the representation of solid models.	**03**
	(b)	State the advantages and disadvantages of CSG representation	**04**
	(c)	Perform a 45° rotation of a triangle A(0,0), B(1,1), C(5,2) (1). About the origin and (2). About the point P(-1, -1).	**07**
Q.4	**(a)**	What do you mean by Subsidiary design equation?	**03**
	(b)	Explain B-rep approach of solid modeling in detail	**04**
	(c)	A cubic spline curve has start point P0 (16,0) and end point P1(3,1). The tangent vector for end P0 is given by line joining P0 and point P2(14,8). Tangent vector for end P1 is given by line joining P2 and point P1. Determine the parametric equation for hermit cubic curve.	**07**
		OR	
Q.4	**(a)**	What are Geometric transformations? State any two advantages of Homogenous coordinate transformations.	**03**
	(b)	Explain the types of geometric models.	**04**
	(c)	What is design optimization? Explain its application in engineering design.	**07**
Q.5	**(a)**	Explain following entities used in surface modeling. i) Plain surface ii) coons patch.	**03**
	(b)	Explain properties of Bezier Curve.	**04**
	(c)	Coordinates of four data point P0, P1,P2 & P3 are(2,2,0), (2,3,0), (3,3,0) & (3,2,0) respectively. Find the equation of bazier curve and determine the coordinates of point on curve for u=0,0.25,0.5,0.75 & 1.0.	**07**

OR

Q.5	**(a)**	Comparison of Analytic curves & Synthetic curve.	**03**
	(b)	Comparison of Wire–frame modeling & solid modeling.	**04**
	(c)	Classification of optimization problems on various basis.	**07**

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