Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2162006 **Date: 05/05/2017**

Subject Name: Computer Aided Design for Mechatronics

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.**

Q.1		**Short Questions**	**14**
	1	What is CAD/CAM?	
	2	Give the full form of IGES.	
	3	Define Topology & Geometry.	
	4	Give the function of Display Controller.	
	5	Define Objective Function.	
	6	What is Inverse Transformation?	
	7	Write down the Equation of Scaling Matrix.	
	8	What is Arithmetic logic Unit.?	
	9	Define Bezier Surface.	
	10	Enlist types of Printers.	
	11	What do you mean by Subsidiary design equation?	
	12	Define Optimization.	
	13	What is Analytical Curve?	
	14	Define Graphic Standards.	
Q.2	**(a)**	Give Specification of Workstations.	**03**
	(b)	Draw the product Cycle with CAD/ CAM.	**04**
	(c)	Why Graphic Standard play important role in CAD. Enlist Various Graphic Standards with full name.	**07**
		OR	
	(c)	Explain Raster- Scan & Frame – Buffer.	**07**
Q.3	**(a)**	Explain the Working of Digitizers & Scanners.	**03**
	(b)	Explain the following 2D Geometric transformation with suitable examples: Translation & Rotation.	**04**
	(c)	A rectangle ABCD has vertices A(1,1), B(2,1), C(2,3), & D(1,3).It has to be rotated by 30° CCW about point P(3,2) Determine: i) The composite transformation Matrix. ii) The new Coordinates of rectangle.	**07**
		OR	
Q.3	**(a)**	What is different software packages used in CAD?	**03**
	(b)	Identify the pixel location that will be chosen by the DDA algorithm while scan converting a line from screen co-ordinate (10, 30) to (19, 36).	**04**
	(c)	Explain B-rep and C-rep approach of solid modeling in detail.	**07**
Q.4	**(a)**	Explain following entities used in surface modeling. i) Plain surface ii) coons patch.	**03**
	(b)	Derive the parametric equation for Hermit Cubic Spline Curve.	**04**
	(c)	A Bezier Curve is to be constructed using control points P_0 (35, 30), P_1 (25, 0), P_2 (15, 25) & P_3 (5, 10). The Bezier curve is anchored at P_0 & P_3. Find the equation of the Bezier curve & plot the curve for u = 0, 0.2, 0.4, 0.6, 0.8, 1.	**07**
		OR	

Q.4	**(a)**	Explain properties of Bezier Curve.	**03**
	(b)	Comparison of Wire–frame modeling & solid modeling.	**04**
	(c)	Explain the Lagrange multiplier Method with suitable examples.	**07**
Q.5	**(a)**	Explain advantages & limitation of B-spline curve.	**03**
	(b)	What do you mean by Optimum Design? Explain objectives of Optimum Design.	**04**
	(c)	Generate a Bezier curve using the control points : (2,0) , (4,3), (5,2), (4,-2), (5,3) & (6,-2).	**07**

OR

Q.5	**(a)**	Explain the approaches of Generation of synthetic curves.	**03**
	(b)	Develop parametric equation for i) Line ii) Circle	**04**
	(c)	Classification of Optimization Problems on various basic.	**07**

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