Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2014

Subject code: 710802N **Date: 17-06-2014**

Subject Name: Computer Aided Machine Design

Time: 02:30 pm - 05:00 pm **Total Marks: 70**

Instructions:

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

Q.1	**(a)**	Explain the role of computer graphics in modeling and simulation of design.	**07**
	(b)	Explain working significances of virtual design and testing softwares.	**07**
Q.2	**(a)**	Determine the pixels for a straight line connecting two points (2, 7) and (15, 10) using DDA algorithm.	**07**
	(b)	Explain Bresenhamôs algorithm for Ellipse.	**07**
		OR	
	(b)	Write a C program of Bresenhamôs algorithm for circle.	**07**
Q.3	**(a)**	Compute the Bezier curve for a set of control points is given by $\mathbf{P}_0 = (4, 4)$, $\mathbf{P}_1 = (6, 8)$, $\mathbf{P}_2 = (8, 9)$ and $\mathbf{P}_3 = (10, 3)$.	**07**
	(b)	Explain parametric representation of surface using 16 points form of Matrix.	**07**
		OR	
Q.3	**(a)**	The corners of wedge-shaped block are A(0, 0, 2), B(0, 0, 3), C(0, 2, 3), D(0, 2, 2), E(ī 1, 2, 2) and F(ī 1, 2, 3), and the reflection plane passes through the y-axis at 45° between (ī x) and z-axis. Determine the reflection of the wedge.	**07**
	(b)	Explain the characteristics of blending functions and twist vectors for surface.	**07**
Q.4	**(a)**	Explain feature based modeling techniques with its significances.	**07**
	(b)	Derive the generalized 2-D transformation matrix for a reflection about an arbitrary line y = mx + c with usual notations.	**07**
		OR	
Q.4	**(a)**	Explain IGES, STL and DXF file format of graphics interface.	**07**
	(b)	What is spline? Explain the properties of normalized B-splines.	**07**
Q.5	**(a)**	Write a C program for rigid coupling design with usual formulae and notations.	**07**
	(b)	Write a C program for Spring Design with usual formulae and notations.	**07**
		OR	
Q.5	**(a)**	Explain the Johnsonôs method of Optimum design.	**07**
	(b)	Prove that optimization in power transmitted by a spur gear occurs when tangential load is equal to dynamic load under the failure of scoring. Assume dynamic load directly proportional to pinion speed.	**07**

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