Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject code: 2715002 **Date: 07-01-2015**

Subject Name: CAD / CAM Systems

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 marks.**

Q.1	**(a)**	Briefly explain various descriptions of major surface entities provided by CAD/CAM systems.	**07**
	(b)	Brief about your understanding of the following solid representation schemes: (1) sweeping, (2) parametric solid modeling, (3) primitive instancing, (4) feature-based modeling.	**07**
Q.2	**(a)**	Attempt any two: 1. Illustrate technical specifications of a typical CAD workstation. 2. As a design engineer in a manufacturing company provide arguments for why you should utilize CAD instead of conventional procedure. 3. Using a block diagram clearly show the configuration of a graphics software.	**07**
	(b)	Find the final concatenated matrix for reflection about a line L with slope m and y intercept (0, b).	**07**
		OR	
	(b)	Define *tilting* as a rotation about the x-axis followed by a rotation about the y-axis: (a) find the concatenated matrix for tilting; (b) does the order or sequence of performing the rotation matter?	**07**
Q.3	**(a)**	1. Describe the space curve through figure whose parametric equations are $x = \cos t$, $y = \sin t$, and $z = t$. 2. Formulate the equation of the 2-D Bezier curve for which the control points are: P_0 (1, 3), P_1 (3, 5), P_2 (5, 4), and P_3 (7, 1).	**07**
	(b)	What do you mean by *curve fairing* technique or *curve approximation*? Compare the properties of Bezier and B-spline curve approximation.	**07**
		OR	
Q.3	**(a)**	Write a detailed note on *wire-frame modeling.*	**07**
	(b)	Enlist the design-related tasks performed by a modern CAD system. Explain any two of them.	**07**
Q.4	**(a)**	State advantages and disadvantages of surface models and their use in engineering and design environment.	**07**

(b) You are given the task of making a surface model of the object shown in Figure 1. Provwide clear guidelines for this task. You may draw necessary sketches. **07**

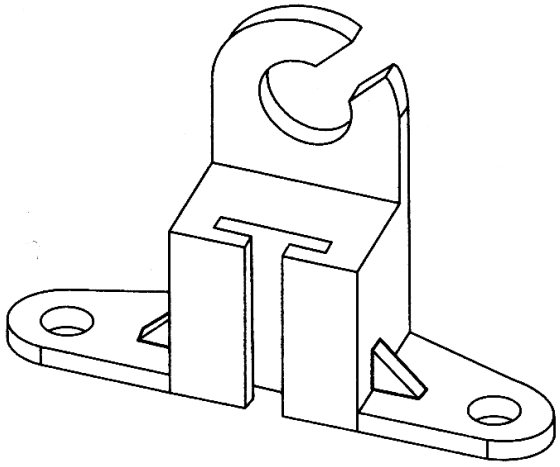

Figure 1

OR

Q.4 **(a)** Show the construction tree for the CSG approach to make solid model of the guide bracket shown in Figure 1. **07**

(b) Select a suitable solid-modeling approach and state the step-by-step procedure to construct the solid model shown in Figure 1. **07**

Q.5 **(a)** Explain, in detail, the procedure from process planning to actual machining during NC machining. **07**

(b) Explain the principle of concurrent engineering. **07**

OR

Q.5 **(a)** Write about the scope of application of CNC technology in CAD/CAM systems. **07**

(b) What are the problems with traditional process planning which led to development of CAPP systems? Explain how the process planning activity can be computer assisted. **07**

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