

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: **07**
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.
- (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 $z = t$. **07**
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 $P_3(7, 1)$.
- (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. Provide clear guidelines for this task. You may draw necessary sketches. 07

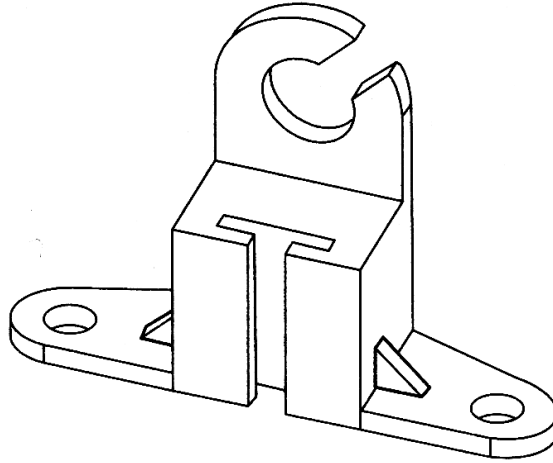


Figure 1

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
