

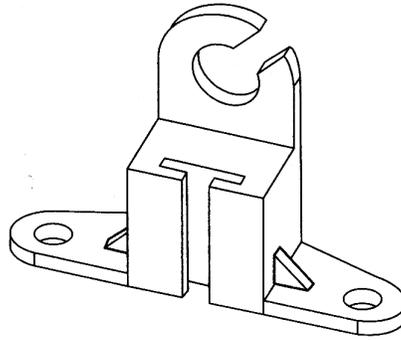
**GUJARAT TECHNOLOGICAL UNIVERSITY****M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2014****Subject code: 715002****Date: 17-06-2014****Subject Name: CAD/CAM Systems****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Abbreviations have usual meaning.

- Q.1** (a) Give your views on how a computer can be used for *engineering analyses*. **07**  
 (b) Discuss the relative advantages and disadvantages of C-rep and B-rep. **07**
- Q.2** (a) Attempt any two: **07**  
 1. Explain the sequence of transformations required for the following two cases of image manipulation: Rotation of the element about an arbitrary point in the element; Magnifying the element but maintaining the location of one of its points in the same location.  
 2. Make a list of operator input devices at the graphics workstation to facilitate communication between the user and the system.  
 3. Using a block diagram show the configuration of a graphics software.  
 (b) Explain Bresenham's line drawing algorithm. **07**
- OR**
- (b) The concatenated transformation of a graphics element consists of the following operations: (i) rotation through  $120^\circ$  about z-axis, (ii) translation through 10 and -20 units along x- and y-directions respectively, (iii) rotation through  $30^\circ$  about x-axis. Develop the concatenated homogenous transformation matrix, if the operations are done in above sequence. Will the sequence of operations affect the end result? **07**
- Q.3** (a) Explain the parametric representation of a Hermite cubic spline segment. **07**  
 (b) Describe any one: (i) The IGES methodology, (ii) Features of GKS. **07**
- OR**
- Q.3** (a) In which software was the Bezier curve first time used and for what purpose? Clearly list out the properties of Bezier curves that render them superior to cubic spline curves and inferior to B-spline curves. **07**  
 (b) Explain in detail any two design-related tasks performed by a modern CAD system. **07**
- Q.4** (a) Explain the feature-based modelling technique used to create solid models. Name a software wherein it has been used. Clearly describe any three features. **07**  
 (b) Describe the various analytic and synthetic surface entities provided by a CAD system. **07**

**OR**

- Q.4 (a)** Narrate in detail, how you would generate a 3D-solid model of the bearing bracket shown in figure. State clearly the name of software, technique used, name of commands, and procedure of each command with figure. **07**



- (b)** Make a comparison among wireframe-, surface- and solid-modeling. **07**
- Q.5 (a)** How do you create NC programs from solid models? Explain. **07**
- (b)** State true or false or fill in the blanks: **07**
- In the case of CAD, 3D modeling is just another name for solid modeling.
  - 3D drawings are impossible without solid modelers.
  - Finite element technique is associated with CAD.
  - PDES, not IGES, better serves the objective of CIM.
  - CIM and concurrent engineering are synonymous.
  - IGES stands for \_\_\_\_\_ and PDES for \_\_\_\_\_.
  - NURBS is an acronym for \_\_\_\_\_.

**OR**

- Q.5 (a)** "Creating the manufacturing data base is now considered to be an important application of a CAD system." Justify the statement for a typical production-oriented company utilizing an integrated CAD/CAM system. **07**
- (b)** Make a checklist of potential benefits that may result from implementing CAD as part of an integrated CAD/CAM system. Include as many points as you think of. **07**

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