

**GUJARAT TECHNOLOGICAL UNIVERSITY****MCA - SEMESTER-VI • EXAMINATION – WINTER 2013****Subject Code: 640008****Date: 13-12-2013****Subject Name: Computer Graphics (CG)****Time: 10.30 am - 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** Explain the following term in brief. **14**
- 1) Data visualization
  - 2) Data gloves
  - 3) Basic OpenGL functions and constants
  - 4) Absolute and Relative co-ordinate
  - 5) Line width
  - 6) Homogeneous co-ordinates
  - 7) Surface Rendering
- Q.2** (a) Write Short note on following **03**
- 1) OpenGL Line functions **04**
  - 2) Nonemissive device **07**
- (b) Explain Raster – Scan display and Random – Scan display. Which system display is better and why? **07**
- OR**
- (b) Write Midpoint ellipse algorithm. **07**
- Q.3** (a) Derive the decision parameter for Bresenham’s line drawing algorithm and explain. **07**
- (b) Describe antialiasing and explain supersampling straight-line segment and subpixel weighting masks in detail. **07**
- OR**
- Q.3** (a) What is polygon table? Explain geometric data table representation for the same. Explain how front and back polygon faces are identified. **07**
- (b) Write and explain Boundary – fill algorithm. Explain both the approaches used for boundary filling method. **07**
- Q.4** (a) Write Short note on following **09**
- 1) General two-dimensional pivot – point rotation
  - 2) Reflection
  - 3) Three – dimensional scaling
- (b) Explain the following functions with parameter in OpenGL **05**
- a) glutInitWindowSize( );
  - b) glColor3f( );
- OR**
- Q.4** (a) Write Short note on following **09**
- 1) General two-dimensional fixed – point scaling
  - 2) Three – dimensional shear
  - 3) OpenGL functions for raster transformation (translation, rotation and scaling)

- Q.4** (b) A triangle is defined in two-dimensional system by its vertices (1,2),(1,3),(2,2) perform the following transformation on the triangle **05**
- a) Translate the triangle in space by 2 unit in x-direction and 3 unit in y-direction
  - b) And then scale the triangle by a factor of 1.5 unit in x direction and 2 in y direction

- Q.5** (a) Explain Cohen – Sutherland line clipping algorithm with example. **07**
- (b) Explain perspective projection with transformation coordinates and equations for special cases. Describe vanishing points for perspective projection **07**

**OR**

- Q.5** (a) Explain Sutherland – Hodgman polygon clipping algorithm with example. **07**
- (b) Explain three-dimensional viewing pipeline and describe three-dimensional viewing-coordinate parameter in brief. **07**

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