

GUJARAT TECHNOLOGICAL UNIVERSITY**MCA - SEMESTER-VI • EXAMINATION – SUMMER 2013****Subject Code: 640008****Date: 31-05-2013****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 (a) Explain the following term **06**

- 1) Aspect ratio
- 2) Data visualization
- 3) Refresh rate
- 4) Homogeneous coordinate
- 5) Surface Rendering
- 6) Viewport

(b) Explain in brief **08**

- 1) CAD
- 2) Touch Panels
- 3) Depth Cueing
- 4) Vanishing Point

Q.2 (a) Write Short Note on following **08**

- 1) Describe OpenGL with basic syntax and header files.
And explain OpenGL Line functions.
- 2) Explain following functions
 - a) glMatrixMode()
 - b) glColor* (colorcomponent)
 - c) glCopyPixels()
 - d) glutInitDisplayMode(mode)

(b) Explain the basic design and operation of Refresh Cathode- Ray Tube **06**

OR

(b) Give the Difference between emissive and nonemissive displays and explain nonemissive display with example in detail. **06**

Q.3 (a) Derive the decision parameter for Bresenham's Line drawing algorithm and explain. **06**

(b) Write Short Note on following **08**

- 1) Inside-Outside tests
- 2) Line Attributes

OR

Q.3 (a) State Midpoint Ellipse Algorithm and explain in brief. **06**

(b) Explain the following **08**

- 1) For a given center (5,5) and radius 10 digitize the Mid-point circle algorithm for first octant.
- 2) Describe the difference between 4-connected area and 8-connected area for filling irregular boundary shapes and explain any one algorithm.

- Q.4 (a)** Give the transformation matrix and final points for a triangle with points A(2,2), B(4,5), C(6,2) after following transformation **06**
 1) Rotate the object for 45° counter clockwise then
 2) Perform uniform scaling for 2 units and
 3) Finally translate the object down for 2 units
- (b)** Write Short Note on following **08**
 1) Antialiasing
 2) Two Dimensional composite transformation for Pivot point rotation and Fixed point scaling
- OR**
- Q.4 (a)** Check and prove whether the multiplication of transformation matrices for each of the following sequences is commutative or not **06**
 1) Two successive translations
 2) Two successive scaling
 3) Individual translation and then rotation
- Q.4 (b)** Explain the following **08**
 1) Compare the efficiency of Nicholl-Lee-Nicholl and Liang-Barsky line clipping algorithm. And Explain NLN in brief.
 2) Write the steps for general three dimensional rotation for an arbitrary axis and state the individual transformation matrices for the same.
- Q.5 (a)** Explain Cohen-Sutherland Line Clipping Algorithm with example. **06**
(b) Write Short Note on following **08**
 1) Orthogonal Projection
 2) Three Dimensional Viewing Pipeline
- OR**
- Q.5 (a)** Explain Sutherland-Hodgman Polygon Clipping Algorithm with example. **06**
(b) Explain the following **08**
 1) Differentiate between Parallel and Perspective projection and explain Perspective projection in brief.
 2) Cavalier and Cabinet Oblique Parallel Projections
