

GUJARAT TECHNOLOGICAL UNIVERSITY**MCA - SEMESTER-IV • EXAMINATION – WINTER • 2014****Subject Code: 2640008****Date: 06-12-2014****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** Attempt the followings. **14**
- 1) Define Data Visualization.
 - 2) What is antialiasing?
 - 3) What is 2D point clipping?
 - 4) Define Rigid Body transformation
 - 5) What is homogenous Coordinates?
 - 6) Explain surface rendering.
 - 7) Vanishing Point.
- Q.2** (a) Explain Random Scan display and Raster Scan display. Which System is better for display and why? **07**
- (b) Write the bresenham line drawing algorithm and specify its advantages over DDA algorithm. **07**
- OR**
- (b) Write detailed note on Computer Graphics. **07**
- Q.3** (a) For a given center at origin and radius 10, digitize the midpoint circle algorithm for first octant. **06**
- (b) Write Short note on following. **08**
- (1) Inside-Outside Test.
 - (2) Non emissive device.
- OR**
- Q.3** (a) Explain General two dimensional pivot point rotation and derive its matrix. **06**
- (b) (1) Explain following functions. **08**
- (i) glutInitWindowSize() (ii) glColor3f() (iii) glMatrixMode() (iv) glCopyPixels()
 - (2) Describe the difference between 4-connected and 8-connected Boundary fill algorithm.
- Q.4** (a) Explain Cohen-Sutherland line clipping algorithm. **07**
- (b) (1) Find the transformation matrix that transforms the given square ABCD to half its size with respect to selected fixed position (2,2) for the coordinates A (1,1), B(3,1), C(3,3) and D(1,3). Also get the resultant coordinates of the square ABCD. **04**
- (2) Explain three dimensional viewing pipeline. **03**
- OR**
- Q.4** (a) What is polygon clipping? Explain Sutherland Hodgeman polygon clipping algorithm. **07**
- (b) (1) Apply the following transformation to square A(0,0), B(1,0), C(1,1) and D(0,1) . **04**
- Shear the original square with shear parameter value of 0.5 relative to the line $y_{ref} = -1$.
 - Reflect the original square about the origin.
- (2) Write down 3 x 3 homogenous matrices for Translation, Rotation and Scaling. **03**

- Q.5** (a) What is projection? Differentiate between parallel and perspective projection. Explain perspective projection in brief. **07**
- (b) What is Shear? Explain various cases for shear with diagrams and equations. **07**
- OR**
- Q.5** (a) Explain different types of parallel projection in details. **07**
- (b) What is window and viewport. Explain two dimensional window to viewport transformation. **07**
