

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER-IV • EXAMINATION – SUMMER • 2015

Subject Code: 2640008

Date: 20-05-2015

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 terms: **07**
1. Image processing
 2. Anti aliasing
 3. Aspect ratio
 4. 2D Point clipping
 5. Pixel phasing
 6. Homogeneous coordinates
 7. Refresh rates
- (b)** Fill in the blanks given below. **07**
1. Each screen point is referred to as
 2. The maximum number of points that can be displayed without overlap on a CRT is called
 3. is an example for non-emissive displays.
 4. The transformation in which an object is moved in a minimum distance path from one position to another is called.....
 5. The region code of a point within the window is
 6. Lower persistence phosphorus is used in.....
 7. The simplest output primitive is
- Q.2 (a)** Explain basic design and operation of cathode-ray tube. **07**
- (b)** Write the bresenham line drawing algorithm and specify its advantages over DDA algorithm. **07**
- OR**
- (b)** Write detailed note on Computer Graphics applications. **07**
- Q.3 (a)** Explain boundary fill algorithm. How it is differ from flood fill algorithm? **07**
- (b)** Derive and explain Mid point circle algorithm for decision parameter. **07**
- OR**
- Q.3 (a)** What is reflection? Explain various types of reflection with its matrices. **07**
- (b)** Digitize the Mid point ellipse algorithm for given input $r_x = 8$ and $r_y = 6$ **07**
- Q.4 (a)** Explain any seven OpenGL Functions for output primitives **07**
- (b)** Apply the transformation to square A(0,0), B(1,0), C(1,1) and D(0,1) given below: **07**
- a) Shear the original square with $sh_x = 0.5$ relative to the line $y_{ref} = -1$
 - b) Shear the original square with $sh_y = 0.5$ relative to the line $x_{ref} = -1$
- OR**
- Q.4 (a)** Describe antialiasing. Name different antialiasing methods and explain any two. **07**

- (b) 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. **07**

Q.5 (a) Explain Sutherland-Hodgman polygon clipping algorithm. **07**

(b) What is projection? Write detailed note on parallel projections **07**

OR

Q.5 (a) Explain Cohen-Sutherland line clipping algorithm. **07**

(b) Write detailed note on 3D viewing pipeline **07**
