

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER- IV • EXAMINATION – WINTER 2017

Subject Code: 2640008

Date: 06-01-2018

Subject Name: Computer Graphics

Time: 02:30 pm to 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.

Q.1 (A) Answer the following questions: 5

I . CAM stands for _____.

II. The technique used to summarize financial, statistic, mathematical, scientific and economic data is

- a. Computer Art
- b. Image Processing
- c. Presentation Graphics
- d. None Of the above

III. 2-D graphs are more efficient than 3-D graphs True or False

IV. The amount of light emitted by the phosphor coating depends on the

- a. Number of electrons striking the screen
- b. Speed of electrons striking the screen
- c. Distance for cathode to the screen
- d. None Of the above

V. Which of the following algorithms can be used for circle generation?

- a. Bresenham's algorithm
- b. Midpoint algorithm
- c. Both (a) and (b)
- d. None of the above.

Q.1 [B] Write Notes on: [Any Three] 9

(A) OpenGL Viewing – Transformation and Orthogonal – Projection Function

(B) Window and View Port.

(C) Line caps And Line Joins.

(D) OpenGL Color Functions.

(E) Perspective Projection and Stereoscopic Views.

Q.2 (A) State Midpoint Ellipse Algorithm and explain in brief. 7

OR

Q.2 (A) Explain any seven OpenGL Functions for output primitives. 7

- Q. 2 (B) What is DDA? Write the DDA algorithm. 7
- Q. 3 (A) Write and explain Boundary – fill algorithm. Explain both the approaches used for boundary filling method. 7
- Q. 3 (B) Write a note on three dimensional rotations w.r.t. x,y and z axis. 7
- OR**
- Q. 3 (A) Short note on 3D Translation and 3D Rotation. 7
- Q. 3 (B) Explain 2D Window to viewport Transformation and its pipeline. 7
- Q. 4 (A) What is projection? Write detailed note on parallel projections 7
- Q. 4 (B) What are the basic 2-D Geometric Transformations? List them and explain Rotation in details (take anti-clockwise rotation as base) 7
- OR**
- Q. 4 (A) Explain the basic design and operation of Refresh Cathode- Ray Tube. 7
- Q. 4 (B) Show the implementation of Sutherland-Hodgeman algorithm for polygon clipping. 7
- Q. 5 (A) 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. 7
- Q. 5 (B) Explain the benefits of Liang – Barsky line clipping algorithm. 7
- OR**
- Q. 5 (A) Write detailed note on applications of computer graphics 7
- Q. 5 (B) Apply the following transformation to square A(0,0), B(1,0), C(1,1) and D(0,1) . 7
- 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.