

GUJARAT TECHNOLOGICAL UNIVERSITY**MCA - SEMESTER-IV • EXAMINATION – SUMMER • 2014****Subject Code: 2640008****Date: 03-06-2014****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 following. 14**
- 1) Differentiate Track Ball and Space Ball.
 - 2) State advantage and disadvantage of DDA Line drawing algorithm.
 - 3) Differentiate Window and Viewport.
 - 4) Refresh Rate
 - 5) Absolute and Relative Co-ordinate.
 - 6) Vanishing Point.
 - 7) Resolution and aspect Ratio.
- Q.2 (a) Explain the basic design and operation of Cathode Ray Tube. 07**
(b) Derive and explain Midpoint Circle algorithm. 07
- OR**
- (b) Digitize the Bresenham line drawing algorithm with end points (18,8) and (28,16) 07**
- Q.3 (a) (i) Explain different categories of Flat Panel Display. 03**
(ii) Explain difference between Boundary and Flood Fill algorithm. 04
(b) (i) Explain following OpenGL functions. 03
(a) `glutInitDisplayMode(mode)`
(b) `glCopyPixels()`
(c) `glColor*(Color Component)`
(ii) Write a note on anti aliasing and specify its various techniques. 04
- OR**
- Q.3 (a) (i) Write a note on inside – outside test. 03**
(ii) Give the transformation matrix and find points of square with points A(0,0) 04
B(1,0) C(1,1) and D(0,1) after following transformation.
- Perform scaling 1 unit in x and 2 unit in y direction.
- Rotate the object 45° counter clockwise
- (b) (i) Write a note on two dimensional scaling. 03**
(ii) Explain Polygon table with geometric data table representation 04
- Q.4 (a) Explain Sutherland-Hodgman polygon clipping algorithm with example. 07**
(b) Explain Liang-Barsky line clipping algorithm with example. 07
- OR**
- Q.4 (a) Explain the Reflection transformation and its various cases with proper diagram and equations. 07**
(b) Explain 2D Window to viewport Transformation and its pipeline. 07

- Q.5 (a)** Explain the different types of parallel projection in details. **07**
(b) Explain general 2D pivot point rotation. **07**
- OR**
- Q.5 (a)** What is projection? Differentiate between parallel and perspective projection Explain perspective projection in brief. **07**
(b) Explain concave and convex polygon. Specify the method for converting concave to convex polygon using example. **07**
