

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER VI- • EXAMINATION – SUMMER 2015

Subject Code: 160703

Date: 08/05/2015

Subject Name: Computer Graphics

Time: 10.30AM-01.00PM

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) Derive all formulas for Bresenham line drawing algorithm. Write a function Bresenhamline(x1, y1, x2, y2, type) so it draws line with specified type. If type=0, solid line, type=1 dashed line and type=2 dotted line **07**
- (b) Derive all formulas for mid-point circle drawing algorithm. Apply algorithm and find out points for circle with radius 8 and centre (0,0) for one octant only **07**
- Q.2** (a) Briefly explain different methods to generate thick lines. Discuss merits and demerits of each method. **07**
- (b) What is frame buffer? How long would it take to load a 640 by 480 frame buffer with 12 bits per pixel if transfer rate is 1Mbps? What is the size of frame buffer? How many colors it support? **07**
- OR**
- (b) Briefly explain scan line polygon filling algorithm. Explain the fields of edge table and criteria for adding and removing edge to active edge table. **07**
- Q.3** (a) Briefly explain NLN line clipping algorithm. What are the advantages of NLN over Cohen Sutherland line clipping algorithm **07**
- (b) Prove that successive rotation is additive and commutative **07**
- OR**
- Q.3** (a) Briefly explain Cyrus Beck line clipping algorithm. Compare Cyrus Beck and Liang-Basky line clipping algorithm **07**
- (b) Determine the transformation matrix which reflects given object about diagonal $y=x$ **07**
- Q.4** (a) Consider square with left-bottom corner at (2, 2) and right-top corner at (6, 6). Find out the transformation matrix which makes its size half such that its centre remains same. **07**
- (b) Define polygon mesh. Briefly explain different methods used to represent polygon mesh with example **07**
- OR**
- Q.4** (a) Consider a triangle with vertices A(1,1), B(5,2) and C(3,4). Find out the transformation matrix which rotates given triangle about point C (3,4) by an angle 30° clockwise. Also find rotated triangle. **07**
- (b) Compare perspective and parallel projection. Briefly explain different types of parallel projections **07**
- Q.5** (a) Classify the visible surface determination algorithm. Briefly explain z-buffer visible surface determination algorithm **07**
- (b) Briefly explain diffuse and specular reflection. **07**

OR

- Q.5**
- | | | |
|------------|---|-----------|
| (a) | Briefly explain different techniques to make visible surface determination algorithm more effective. Briefly explain back face culling algorithm. | 07 |
| (b) | (1) Briefly explain LCD and LED display | 04 |
| | (2) Briefly explain CMY color model | 03 |
