

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-VI • EXAMINATION – WINTER • 2014**

**Subject Code: 160703**

**Date: 01-12-2014**

**Subject Name: Computer Graphics**

**Time: 02:30 pm - 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) Explain scan line fill algorithm. What is the use of edge table and active edge list? **07**
- (b) 1. Explain shadow mask method. **03**
2. How long it would take to load a 640 x 400 frame buffer with 12 bits per pixel, If  $10^6$  bits can be transferred per second? **02**
3. Define aspect ratio. If image of size 1024 x 800 needs to resize to one that has 640 pixels width with the same aspect ratio, what would be the height of the resized image? **02**

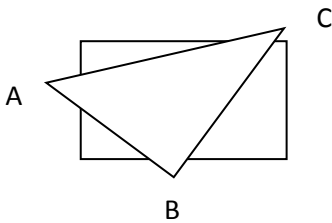
- Q.2**
- (a) What is aliasing? Briefly explain anti-aliasing techniques. **07**
- (b) Give advantages and disadvantages of DDA algorithm. Draw a line from (20,10) to (30,18) using DDA algorithm. **07**

**OR**

- (b) 1. Explain trigonometric method for circle generation. **02**
2. Discuss midpoint circle algorithm with example. **05**
- Q.3**
- (a) 1. Write 2 X 2 transformation matrix for each of the following rotation about origin (a).Counter clock wise rotation by  $180^\circ$  (b) Clock wise rotation by  $90^\circ$  **04**
2. Explain DVST. **03**
- (b) Clip the line using Liang Barsky algorithm against window with  $(x_{w_{min}}, y_{w_{min}})=(0,0)$  and  $(x_{w_{max}}, y_{w_{max}})=(100,50)$ . Line end points are A(10,10) and B(110, 40). **07**

**OR**

- Q.3**
- (a) Perform  $45^\circ$  rotation of a triangle A(0, 0), B(1, 1) and C(5, 2). Find transformed coordinates after rotation, (a). About origin, (b) About P(-1, -1) **07**
- (b) Write the Sutherland – Hodgeman polygon clipping algorithm. Using it clip the given polygon against the clipping window. **07**



- Q.4**
- (a) What is Bezier Curve? Define properties of Bezier Curve. **07**
- (b) What is Parallel Projection? Explain in details types of Parallel Projection. **07**

**OR**

- Q.4**
- (a) What is window and view-port? Retrieve equation for the scaling factor to map the window to view-port in 2D viewing system. **07**
- (b) Write a Short note on:
1. 3D Rotation **04**
2. 3D Translation **03**

- Q.5**
- (a) 1. Define: Complementary Colors, Saturation, Luminance **03**
2. Explain various light sources. **04**

(b) Explain CIE diagram with its usefulness. **07**

**OR**

**Q.5** (a) Explain Z buffer algorithm for hidden surface removal. **07**

(b) Explain RGB and CMY color models. How conversion from RGB to CMY is done? **07**

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