

(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 1409**

Roll No.

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## MCA

THIRD SEMESTER EXAMINATION, 2004-2005

### COMPUTER GRAPHICS AND ANIMATION

Time : 3 Hours

Total Marks : 100

- Note :** (i) Attempt *ALL* questions.  
(ii) All questions carry equal marks.

1. Attempt *any four* of the following :— (5x4=20)

- What are parallel line algorithms ? Set up a parallel Bresenham's algorithm for given  $n_p$  processors.
- Give architecture of raster graphic system with a display processor.
- What are the shadow mask methods ? Explain delta - delta shadow mask method.
- Illustrate applications of antialiasing techniques to the boundaries of areas to remove jagged appearance.
- How can image be drawn and change display through frame buffer bit pattern ? Explain through diagram.
- How does a flat panel display work ?

2. Attempt *any four* of the following :- (5x4=20)

- (a) Produce a scaling matrix for concatenating the matrices for some specified operation.
- (b) Give the explicit form of  $n \times n$  matrix representing transformation : scaling by a factor of 3 in the  $x$  direction and then rotating about a point  $p(x,y)$ . You can assume values for illustration purpose.
- (c) Explain any text clipping algorithm that clips individual characters, assuming that the characters are defined in a pixel grid.
- (d) Define Odd Even and Nonzerowinding number rules. How do you identify interior and exterior regions for a self-intersecting polygon.
- (e) How do you account for the fact that displayed lines and curves have finite widths ? Develop a scheme for this.
- (f) Explain mid-point sub-division algorithm.

3. Attempt *any two* of the following :- (10x2=20)

- (a) Explain with the help of diagram, how do we delete a segment ?
- (b) Derive the transformations matrix for scaling an object by a scaling factor  $S$  in a direction defined by the direction cosines  $\alpha$ ,  $\beta$  and  $\gamma$ .
- (c) Write short notes on :
  - (i) Visibility
  - (ii) Image transformation

4. Attempt *any two* of the following :- (10x2=20)

- (a) How do you make use of grids, gravity field and dragging in the interactive picture construction techniques ?
- (b) Name any five of hardware input devices with their working.
- (c) Explain in detail the concept of depth line buffer method to eliminate hidden surfaces.

5. Attempt *any two* of the following :- (10x2=20)

- (a) What is meant by projection ? Explain perspective projection. Also obtain transformation equations for a perspective projection.
- (b) Write short notes on any two of the following :
  - (i) 3d Transformation
  - (ii) 3d Projection
  - (iii) 3d Clipping
- (c) Discuss the Bezier and B-spline algorithms with examples. Also give their comparisons.

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