# MCA 3rd Semester Examination 2013
## Paper - XII
## (Cmputer Graphics)

Time : 3 Hrs. Full Marks : 80

1. Answer any five questions from the following

$2 \times 5 = 10$

(a) What are the major application of computer graphics?

(b) What are the different resolution schemes that are used in video display devices?

(c) What do you mean by video compression?

(d) What are the redundancy that occurs in a digital video when same information is transmitted more than once?

(e) What do you mean by refreshing? What is refresh rate?

(f) What are the different types of video signals? Name them.

(g) What is liquid crystal made of?

2. Answer any three questions from the following

$4 \times 3 = 12$

(a) How does DDA algorithm differs from Bresenham's algorithm? Describe advantages and disadvantages of both.

(b) What are the different methods of area filling on a raster system? What are the attributes that control the fill area function?

(c) Describe the bitmap based method for generating characters in computer screen.

(d) What is aliasing? Why does it happen? How could we overcome the problem?

(e) How the matrix representation of trnaslation, scaling and rotation are presented?

3. Answer any three questions from the following $6\times3 = 18$

(a) Why homogeneous coordinates is being introduced? How does it eliminate the problem of concatenation of different transformation about an arbitrary point?

(b) Show that the composition of two rotations is additive by concatinating the matrix representations for $R(\theta_1)$ and $R(\theta_2)$ to obtain $R(\theta_1).R(\theta_2) = R(\theta_1+\theta_2)$

(c) What is reflection? Describe the basic principles of reflection transformation with the help of an example.

(d) What is viewing pipeline? Describe the mechanisms that are involved in a viewing pipeline. How does window-to-viewport conversion is performed?

(e) Define B-spline curve, uniform B-spline and open uniform B-spline.

4. Answer any four questions from the following $10\times4 = 40$

(a) Write an algorithm for generating an ellipse.

(b) Describe the Cohen-Sutherland line clipping algorithm with a rectangular clipping window.

(c) Why the concept of illumination model is required to study the structure of an object. Describe the basic



illumination models applied on a scene based on standard lighting conditions.

(d) Describe virtual environment display. Why it is being used? What are the three main phases that a virtual environment is passed through.

(e) Magnify a triangle with vertices A(0, 0), B(1, 1) and C(5, 2) to twice is size while keeping C(5, 2) fixed.

(f) Generate the complete transformation matrix and equation for a rotation about a line that is not parallel to one of the coordinate ones in a three dimensional plane.

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