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

PAPER ID : 2146 Roll No.

M.C.A.

(SEM. V) THEORY EXAMINATION 2011-12

COMPUTER GRAPHICS AND ANIMATION

Time : 3 Hours *Total Marks : 100*

Note :– Attempt **all** questions.

1. Attempt any **two** parts : **(10×2=20)**

   (a) (i) What are the major components (hardware and software), needed for computer graphics ?

   (ii) Distinguish between random scan and raster scan displays.

   (b) Consider two raster systems with the resolutions of 640 × 480 and 1280 × 1024.

   (i) How many pixels could be accessed per second in each of these systems by a display controller that refreshes the screen at a rate of 60 frames per second ?

   (ii) What is the access time per pixel in each system ?

(c) (i) Describe briefly Bresenham's circle drawing algorithm. Why do we prefer incremental algorithm over DDA ?

(ii) Write down a line generating algorithm.

2. Attempt any **two** parts : **(10×2=20)**

(a) (i) Discuss general procedure for scaling parameters to reposition two-dimensional objects.

(ii) Find the transformation matrix for the reflection about the line y = x.

(b) (i) What do you mean by composite transformation ? Explain with the help of example.

(ii) Distinguish between window port and viewport. Describe how window to viewport mapping is done ?

(c) Write a procedure to implement the Liang-Barsky line clipping algorithm.

3. Attempt any **two** parts : **(10×2=20)**

(a) What are the various 3D geometric primitives ? Discuss.

(b) Define an efficient polygon representation for a cylinder. Justify your choice of representation.

(c) How do you obtain a perspective projection of a three dimensional object ? Explain with the help of example.

4. Attempt any **two** parts : **(10×2=20)**

(a) Explain the following with examples :

(i) Ellipsoid

(ii) B-spline curve

(b) Why do we need illumination models ? Describe various illumination models.

(c) What do you mean by hidden surface ? Describe any hidden surface removal algorithm.

5. Attempt any **two** parts : **(10×2=20)**

(a) Define animation sequences. What are the various steps involved in animation sequence ? Describe.

(b) Write a short note on animation languages.

(c) Write note on Interpolation.